The Story of Education

by I. N. Thut

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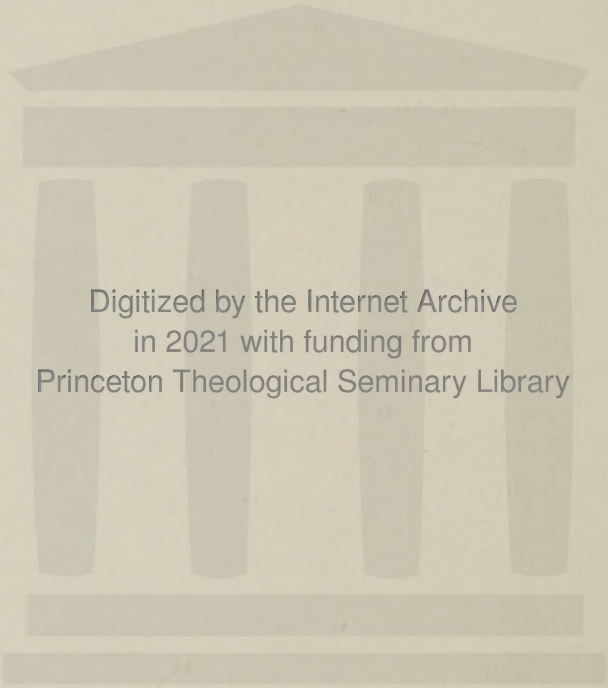
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THE STORY OF EDUCATION

PHILOSOPHICAL AND HISTORICAL FOUNDATIONS

by I. N. Thut

PROFESSOR OF EDUCATION
THE UNIVERSITY OF CONNECTICUT

PRINCETON THEOLOGICAL SEMINARY
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This book is dedicated with
my deepest gratitude and affection
to Vella M. Smart and J. Guy Smart
whose industry, integrity, generous public
service, and good will to all have taught me
more about the good life and the ways of free
men than I could ever learn from books

Preface

Writing a book that centers on the theory of education is a project not to be undertaken lightly these days. The difficulty arises not so much from a lack of interest as from the fact that so many people in so many walks of life already have assumed a position so positive in the matter that they are no longer able to entertain a different point of view in a friendly manner. We need only listen to the statements of men and women active in public life and to read the plans proposed by this group or that to become fully aware of the fact that education has become for many individuals an emotionally charged word. All too frequently participants in the current discussions set themselves up as authorities and proclaim their opinions with the assurance of a prophet of old. Fortunately for the cause of education so many of these statements and plans are in direct conflict that, for the most part, teachers and pupils are able to get along with the work at hand as best they know how.

It seemed appropriate under these circumstances to write a book that tells the story of the several conflicting views on education in the light of their philosophical origins and historical development. It was felt that such a book should enable teachers and laymen to judge with knowledge and understanding the several theories and systems of practices urged upon them today. Hence, this book is addressed to that large group of individuals who are involved in the educative process in one way or another but who may have had no special preparation in philosophy and history for their work.

In writing this book, I have felt justified in taking certain liberties with my subject matter which generally are permitted those who speak of complex matters to the uninitiated. The desire to communicate in understandable terms about matters basically philosophical in nature has dominated this work from beginning to end. It accounts for various departures from the treatment of these matters which philosophers, by long tradition, have given them when they communicated with their fellow philosophers. Hence, if by chance any of them should encounter this work and find it disappointing from the standpoint of their more highly specialized interests, I beg them

to remember that this is a book written by a teacher for teachers and interested laymen!

I am indebted to many individuals for help given in various forms. First among such persons I want to acknowledge the inspiration and direction given me by the late Boyd H. Bode who was for many years a distinguished teacher at Ohio State University. It was my distinct privilege to study with him as a graduate student and to correspond and exchange ideas with him even while the outline of this book was taking shape. I wish to make clear, however, that any shortcomings in this work are not to be attributed to him, or to anyone other than myself. My friend and colleague Harold P. Knauss, Head of the Department of Physics, The University of Connecticut, kindly read portions of this manuscript which deal with scientific matters and offered suggestions for their improvement. Frederick J. Zilli, Head of the Department of Languages, New Haven State Teachers College, helped with the translations from the French sources of the materials quoted in Chapter 10. Solomon E. Wollman, University Photographer, gave most generously of his time and the benefits of his experience in helping me prepare certain illustrative materials. Mrs. Dorothy Ritchie Haynes, Mrs. Lorraine Bober, and Mrs. Sally Whitham were especially helpful in preparing the manuscript for publication.

I am also grateful to the various authors and publishers who have given me permission to quote from their works. The list of these is too extensive to be included here. Credit is given each source in the text where the quoted materials appear. Similarly, a number of sources were drawn upon for illustrative materials and such sources also are acknowledged with credit lines. However, I wish to mention in this special way the generous help given me by the Watkinson Library of Trinity College; the Library of the Hartford Theological Seminary Foundation; the American Schools of Oriental Research; the Photographic Section of the New York Public Library; the Metropolitan Museum of Art; the Swiss National Tourist Service; and the architectural firm of Lyons and Mather, Bridgeport, Connecticut. To all of these and to many others not specifically mentioned here, my sincere thanks for their help and encouragement.

I. N. Thut

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Part I

KNOWLEDGE, DECISION MAKING, AND THE GOOD LIFE

CHAPTER 1

THE ROLE OF KNOWLEDGE IN DECISION MAKING

Each generation of men seems to regard the age in which it lives as filled with difficulties and dangers such as no other generation before it has faced. Thus, the people living today worry and complain about the momentous decisions they are called upon to make and sometimes are heard to wish for what they believe were the simple times in which their forebears were privileged to live out their lives. This attitude is not likely to be dispelled by the aged, for they, forgetting the anguish of indecision which may have characterized their own youth, speak of the good old days and complain that the world in general, and young people in particular, are seemingly intent on achieving their certain and early destruction.

The backward look induces nostalgic longings precisely because the past is now safely beyond the power of living men to change it. No knowledge we now possess or may hope to acquire can give us the ability to bring about a line of developments or a sequence of events other than that already written in the records of time. The issues which agitated the people of the past have already been resolved, whether for good or for bad, and no necessity can arise from the circumstances which created them to force us to return to them against our will. Retrospect therefore affords a restful view. All the decisions have already been made, and weighing the possibility that some course other than the one chosen might have been elected is now merely an idle speculation and of no practical consequence *except as it might have bearing upon future decision making.*

But what sharp differences distinguish retrospect from prospect! We pay respect to that difference whenever we observe that foresight is more difficult than hindsight or comment upon the advantages of second guessing. Unlike the roads that lead out of the past to our present point in time, the roads

ahead are never clearly visible for any considerable distance. As yet, nobody has learned how to explore the roadways leading into the future ahead of the present moment of time, and as a consequence there is nobody to whom we can turn for precise and complete information about what lies ahead. It is the inability to see and to know what lies ahead that makes the present moment of decision so difficult for us. In spite of all our anxiety and trepidation, however, there come times when decisions can no longer be deferred. We must hazard some particular choice even though the consequences of that choice are not fully known, either for ourselves or for those who will come after us.

The necessity of making choices which may have far-reaching consequences makes our contemplation of the present much more disturbing than the past. What are the events that will follow from whatever course of action we may elect? How can we make certain that we have before us all the possible alternatives? These and other questions come to mind whenever we face a time of decision. Yet the decisions must be made if we are to escape the necessity of submitting to blind chance.

The weight of decision making has led men to search for clues that will reduce the element of uncertainty. Each generation, hopeful that its decisions will enable it as well as posterity to reap the benefits of the good life in greater measure than those who have gone before, anxiously surveys the issues at hand. The search for possible signs that will guide our way to the good life is known as man's eternal quest for knowledge of the good. It is a continuous search, for each generation must take up its life at its own stage in history. And each stage presents its own unique problems, which are determined in part by the particular social and physical conditions that have resulted from the particular choices made by its predecessors. Thus, the need for new knowledge is ever present, and the search must go on without end.

It was the need for knowledge that led primitive peoples to look for signs in the flights of birds, in the entrails of freshly killed animals, and in the movements of the stars. Certain individuals came to be considered to have special powers to foretell the future. Ordinary men, distrusting their own ability to read the future, turned to wizards, soothsayers, and oracles for what was believed to be more reliable knowledge to guide their decision making. Judging by the degree to which astrology, palmistry, tea-leaf reading and other forms of fortune telling continue to thrive in modern times, we have reason to suspect that the ways of the ancients have not been abandoned altogether even in the twentieth century.

But, generally speaking, modern men have turned to other forms of knowledge and ways of knowing. There are many such ways, and each has claimed the loyalties of certain peoples at certain times. When different

forms of knowledge have appealed to different segments of the population at a given time, clashes of opinion have occurred. Such conflicts have been both frequent and bitter. Very often they have marked the emergence of an entirely new way of life with numerous and extensive changes in the social, economic, and political life of the people who were persuaded to accept one or another of them as their guide. The history of the origin and nature of these conflicts is in a very real sense the story of the evolution of civilization itself.

Many informed individuals living today are convinced that the present generation is witnessing just such a critical turning point in the evolution of our own culture. In any event, there is much confusion about the forms of knowledge which present societies should employ in reaching their own decisions. The conflict is said to be one of ideologies, which is merely another way of saying that the several parties to the conflict subscribe to different ways for acquiring knowledge of the life which is good to live. In this period of uncertainty, problems are pressing for solutions and decisions are being made, and it seems a matter of the utmost importance that the people involved should become acquainted with the issues that are at stake.

Perhaps the nature of the present time of decision, as well as the role played by the several systems of knowledge in conflict, can be understood more clearly if we turn for a moment to the period in history out of which the great American adventure was born. It, too, was a critical turning point marked by bitter conflict of opinion and some physical violence. With that purpose in mind, certain aspects of the conflict which have special reference here are reviewed briefly.

A Time of Decision

Fifteenth-century Europe presented in many aspects the picture of a culture that had outlived its period of greatest usefulness. Its entrenched institutions, its social and intellectual traditions, and the personal aspirations of its leaders were drawn, for the most part, from the age of feudalism. The ambitions of individuals born in less favorable circumstances faced the formidable opposition of a rigid class structure. Power and wealth were closely held by members of the nobility and the clergy. Needless to say, law and deep-seated custom contributed their full measure in supporting and preserving the *status quo*.

It was also apparent that important segments of the people were becoming impatient under these conditions. There were signs of restlessness here and there which suggested that long-needed changes were overdue. Religious leaders were increasingly occupied with the task of detecting and stamping

out heresy. A new intellectual life was struggling for a place in the academic sun. The old empire which had been held together for so many centuries by the influence of Rome was falling apart. Young monarchies were rising that refused to recognize any authority as superior to their own. In short, the European social system, bursting at the seams because of the pressures from within, was in a most precarious situation when Christopher Columbus, contrary to the predictions of his contemporaries, returned safely from his voyage across the ocean.

America—the Land of Hope

News of the discovery of a new world lying across the Atlantic Ocean produced very revealing reactions on the part of the European. Here, it seemed, was a golden opportunity which could make it possible for each individual to live the good life as he projected it in his fondest dreams. To the men of Spain, gold and jewels were the keys to success. Thus, it was they who plundered and despoiled the Indians of Mexico and Peru without conscience. The landless sons of the French and English nobility hoped to carve lordly estates from the wilderness. Savage tribes and pagan civilizations challenged priests to win new souls to their church. Even middle-aged men about town fell victim to wild rumors of magical streams whose waters could renew the strength and appetites of youth. Thus, for more than a century the New World was looked upon primarily as a land to be exploited, as a land which could be used to make real the old dreams of an old world.

In light of the social and intellectual unrest that was present in sixteenth-century Europe, it seems most strange that the idea of building a new way of life in the New World was not entertained earlier and more seriously. This omission is even more curious when it is recalled that important members of the intellectual circles quite generally engaged in projecting the outlines of the ideal society. Among these efforts we remember best perhaps the work of Thomas More. Even Francis Bacon, coming at the end of this period, was apparently unable to resist the urge to speculate on the subject, for his *New Atlantis* was published in 1627.

Although a number of settlements were established in America by Europeans before 1620, they were primarily either military outposts to entrench the established powers or open attempts to transplant an old culture to the New World, as among the first generation of Virginians. The fact remains that no successful bid to cast off the ways of the Old World was made until a band of religious exiles decided to escape their oppressors by seeking refuge in what was then the wilderness of northern Virginia.

A Conflict of Authority

To most American school children, the story of the Pilgrims and their voyage across the Atlantic in search of religious freedom is a familiar one, indeed. Enticing pictures of the *Mayflower,* of the wilderness, and of the Indians whom the exiles encountered on arrival sometimes appear in the first schoolbooks that are put in their hands. The origin of our traditional Thanksgiving Day, with its emphasis upon good food in abundance, is related and relived early in each school year. All things considered, the modern accounts have succeeded in portraying the episode in the light of good fun and high adventure.

Unfortunately, the story of the great intellectual and emotional struggles which led to and accompanied the journey into the wilderness is less familiar. The omission is unfortunate because the modern child is growing up to face problems and issues surprisingly similar in content to those out of which the Plymouth adventure was born. The problem of planning for the future under circumstances shrouded in uncertainty and filled with the unpredictable caused the Pilgrim to reflect upon the foundations of his faith, as they also cause us to reflect today. He came to believe that certainty could be won for himself and his children only if he followed a system of knowledge and a way of knowing given him for just such circumstances as those he faced. His problem became difficult, however, when he remembered that the king insisted that he follow a different set of rules. In that sense, the Pilgrim encountered a conflict of authority, and he was compelled to make a difficult choice.

We must remind ourselves that the king to whom the Pilgrim was expected to give his undivided loyalty ruled not by the consent and at the pleasure of his subjects but on the basis of a claim to special knowledge said to be of divine origin. This claim was said to give the sovereign authority to decide even such matters as the subject's form of worship, his mode of making a living, his place of residence, and the reward he should receive for his labors. The subject lived and died at the command of the king. Under this arrangement, the king and his agents could assume the responsibilities for decision making, as well as the power to put their decisions into effect, and they did so to a degree we find difficult to comprehend today.

At first glance, such an arrangement could be made to appear advantageous to the average subject. If the responsibilities for decision making rest with the sovereign, the ordinary man is spared the necessity of troubling his mind about many vexing matters. As a matter of fact, the seventeenth-century English subject of common origins found it unnecessary—indeed, he found it unwise—to weigh the merits of making an alliance with France or of

waging war with Spain. The public treasury was spent and to a degree replenished at the command of the king. Religious beliefs and the forms of worship were prescribed by the hierarchy of the established and protected church. Custom and decree regulated everyday social and economic affairs. Thus, if he was content to accept the established system and refrained from asking disturbing philosophical questions, the average subject had very little occasion to inquire into the rightness or wrongness of his acts. By living the life indicated for him, he might live in peace with his neighbors and be assured by his superiors that a reward awaited him in the hereafter commensurate with the degree to which he fulfilled the obligations placed upon him. Many Englishmen of that day chose to do just this and remained obedient to the will of the king.

On the other hand, this arrangement can be shown to have certain shortcomings. Thus, the loyal English subject of that day was not the master of his own destiny. He could not plan and provide for his family in a way of his own choosing. Indeed, until relatively recent times, the subject of common ancestry, as distinguished from royal ancestry, in most of the European states could not own the land on which he lived or from which he was expected to take his living. The life of the subjects belonged to the king, and large numbers of them were required to devote a major portion of their time not to cultivating their own garden or to pursuing their own purposes but to serving the state. This was a burdensome form of taxation held over from feudal times.

The aspects of this arrangement which proved especially irritating to the English religious dissenters, from among whom the Pilgrims were drawn, was the assertion of authority by the crown in matters of religion. The absolute authority exercised by the crown in this matter can be understood when we recall that in the twenty-five years from 1534 to 1559 the loyal subject was required by royal decree to change his beliefs first from Catholicism to Anglicanism under Henry VIII, then back to Catholicism under Mary, and finally back to Anglicanism under Elizabeth I.[1] The crown exercised this sweeping authority and received widespread obedience by virtue of the long-established tradition that the king rules by divine mandate. The command of the king, according to that tradition, was said to be nothing less than the will of God made known to men through the person whom God had appointed to be His spokesman. It was in this sense that the king was believed to have access to knowledge denied ordinary men. Logically, therefore, the king was believed to speak with the authority of God on all matters, including those of religious beliefs.

Though they loudly proclaimed their loyalty to the king as their temporal

[1] See Crane Brinton, *Ideas and Men,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1950, pp. 318–319, for a more detailed description of this troubled period.

ruler, the religious dissenters of seventeenth-century England took strong exception to his assertion of authority in religious matters. In keeping with Protestants in general, they taught that the will of God had been revealed to men for all time through the teachings of Jesus. This, they said, is recorded in the New Testament, where it is accessible to all men without reference to rank, wealth, or social standing. As an open book, the Scriptures need no special agent, whether king or priest, to interpret them. In fact, the "dissenters," as the word suggests, came to believe that many of the laws, customs, and practices advocated and maintained by the crown ran counter to the teachings of Christian revelation. On the conviction of faith, these people challenged the authority of the king and the established church and proposed to accept in its place the authority of "the Book."

Here, then, was a direct challenge to the traditional authority of the king to make decisions for his subjects. That challenge was issued by a group of subjects who declared themselves, in effect, to be exceptions to the law of the land. It was this act of separating themselves from the established way of life that earned for some of the dissenters the name of Separatists. It is small wonder, therefore, that the king looked upon the dissenters as rebels and that he and his administrative organization, including the officers of the Church of England, employed the vast powers at their disposal in a great effort to subdue the insurrection. The ensuing struggle in all its bitterness must be looked upon as a struggle between peoples who gave their loyalties to conflicting ways of life—between two groups, each of which had its own theory about how men may learn to know how they should live.

The Construction of a New Authority

The familiar story of the Pilgrims relates how this small group of dissenters sought refuge from the fury of the king, first in Holland and later, reinforced by some recruits from England, in the wilderness of America. Not so familiar to the school child is the story of the intellectual struggle that took place on the *Mayflower* while en route to the New World. Faced with the prospect of being placed on their own in a land far removed from the guiding and protecting power of the king, these men were forced to assume the responsibilities of decision making. They were intelligent men, and they recognized that now they would no longer be able to blame injustice, mismanagement, and wrongdoing upon a misguided ruler. Hereafter, they alone would have to bear the responsibilities for their mistakes as well as to enjoy the rewards of good judgment. Upon their shoulders now rested the whole responsibility for determining by what means they would make sure that in the settlement which they were about to found only good decisions would be rendered. But now that they had rejected the decision-

Fig. 1. Carver and Cushman pleaded the case of the exiled Pilgrims before James I. James refused to permit them to return from Holland under acceptable terms and this led to the Plymouth adventure.

making offices of the crown, what agency did they propose to put in its place?

It appears that the Pilgrims recognized the nature and seriousness of their problem almost from the beginning. There is evidence that the men of the party met almost daily while on board ship to debate the matter. The issues were not finally settled, however, until the *Mayflower* stood offshore in the new land. The final product of their deliberations was put on record in the historic Mayflower Compact. In this agreement, signed by all the male adults

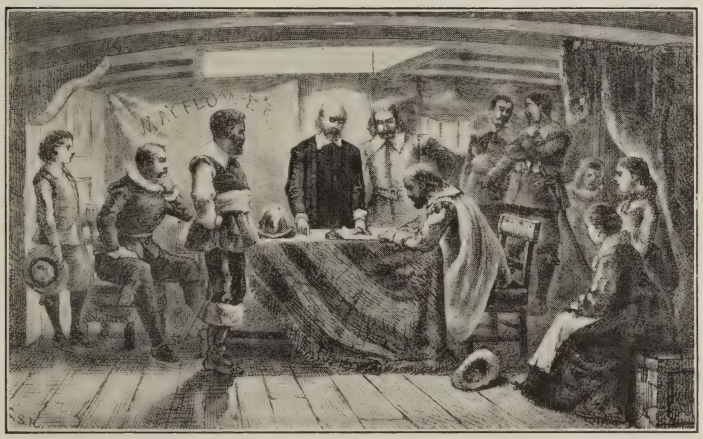

Fig. 2. Pilgrims signing the Compact before leaving ship.

except eight servants and one dying Pilgrim, this hardy group of exiles designated *themselves* as the agency which would govern in the place of the king. Their historic decision was proclaimed in the following words:

. . . We, whose names are underwritten . . . having undertaken, for the glory of God, and advancement of the Christian faith, and honor of our King and country, a voyage to plant the first colony in the northern part of Virginia, do by these presents solemnly and mutually in the presence of God, and of one another, *covenant and combine ourselves together into a civil body politic* [2] for our better ordering and preservation and furtherance of the ends aforesaid; and by virtue hereof to enact, constitute, and frame such just and equal laws, ordinances, acts, constitutions, and offices, from time to time, as shall be thought most meet and convenient for the general good of the colony, unto which we promise all due submission and obedience. In witness whereof we have here-

[2] Italics supplied.

under subscribed our names at Cape Cod the 11th of November . . . *Anno Domini,* 1620.

With this decisive action, the Plymouth Colony planted the seeds of a new social as well as religious idea on American soil. Decision making was thereby asserted to be the privilege of the people themselves. With the power to make decisions securely in their own hands, the Pilgrims now felt themselves free to turn to whatever source of knowledge they believed would guide them to the life good to live. For this purpose, the people of Plymouth chose the Bible as their book of knowledge, and Bible reading became for them a matter of the greatest importance. Whether the decisions to be made were of an individual nature or involved the well-being of the settlement as a whole, the account of their adventure shows that they turned to "the Book" again and again for guidance and support.

As we shall see later, this commitment to live by knowledge derived from a source that was accessible to all and the resolution to arrive at decisions affecting the common good through free and open discussion and mutual agreement led to the establishment of distinctive political and social arrangements. The commitment to a new way of knowing made necessary the development of a new way of life. Though the Plymouth Colony never was able to secure a charter and was, in fact, later brought under the jurisdiction of the Massachusetts Bay Colony, the principle of local government based upon personal participation and common consent was permitted to take root in a uniquely hospitable environment. Protected by the wilderness and the ocean and cultivated by eager hands, that principle has matured and propagated. Successive generations have defended it successfully against the attacks of its enemies from without and of its detractors from within. This principle, in essence, is the heritage of modern America.

CHAPTER 2

THE SCHOOL: SYMBOL OF FAITH IN A PARTICULAR FORM OF KNOWLEDGE

When we reflect upon the matter, it becomes apparent that the Mayflower Compact signified a premeditated and determined break with the customary ways of knowing and systems of knowledge. The Pilgrims had no compelling reason to establish a new form of government other than that they were determined to live by the light of the only form of knowledge which they were convinced would lead to the good life. They were well-informed individuals. They knew that other peoples in other times had elected to make entirely different arrangements. Usually such peoples had turned to special individuals who were believed to have special knowledge or superior ways of acquiring new knowledge. For example, when the children of Israel had become dissatisfied with the leadership of their tribal priests, they had sought out the tallest and strongest man in their midst and placed upon him the responsibility of making their decisions for them. The man so chosen was Saul. He, in turn, had been succeeded by the popular hero, David. Each in his own time had ruled as a king with absolute power to make sure that his, and only his, decisions were put into effect.

Similarly, the ancient Egyptians had followed their pharaohs with a reverence and loyalty bordering on the fanatical. Their blind trust in the decision-making powers of the ruler was based on the legend that he was a superman, the direct descendant of the gods who inhabit the sun and to whom he would return in due time. Ancient Athens had risen to greatness under a limited form of popular government but had fallen victim, in time, to the power of a military dictatorship. As we shall see later, it was at that point in Athenian history that Plato offered his idealistic plan of government in which he proposed to assign the decision-making powers to an intellectual elite. Other stages in the history of Europe offered the

Fig. 3. Samuel, last of the judges, anointed Saul the first King of Israel and thereby announced that the new King had the blessing of God in making decisions for the people. (*From the Doré Bible.*)

Pilgrims ample evidence of societies which had placed their trust in the decision-making powers of a strong man, of a demagogue, of self-appointed councils or committees, of a priest class, or of a hereditary aristocracy. Yet the Pilgrims passed over all these systems and elected to retain the decision-making powers in their own hands by creating the "civil body politic."

An Act of Faith

The Pilgrims' decision to refer all matters affecting the general welfare to the civil body politic was a unique act of faith. It is true that some of

Fig. 4. The faith of the Pilgrim in the Bible as his guide is clearly portrayed in this farewell meeting of the Congregation in England.

the dissenters in England had dealt with matters of belief and church administration on the level of the local congregation. This was in sharp contrast to the hierarchical control which prevailed in the Church of England. The decentralized system of control employed by these congregations suggests the term *congregationalism,* the term most frequently used to identify the system followed by their successors in America today. But the congregational plan of government had not been tested as a method for directing the social and political affairs of men. The decision to so extend it was a calculated risk, a deliberate step beyond the realm of certainty.

The courage the Pilgrim needed to take this historic step was derived from his complete confidence in the Scriptures. To the Pilgrim, the Scrip-

tures contained full and adequate directions for the conduct of life in all its phases. He had an unshakable conviction that, if followed to the full, those directions would lead to the establishment of the best set of temporal arrangements man might ever hope to enjoy on earth. In short, the Scriptures represented for the Pilgrim, and for the dissenters in general, the only bona fide blueprint which could advance him on the road to the good life. To win for himself and for his descendants the benefits promised those who follow the will of God in these matters, he was willing to hazard much.

He also realized that building the desired utopia would require the undivided loyalty and the utmost effort of each colonist. This undertaking would therefore have to be built on the foundation of mutual interest and agreement. When he viewed the proposed civil body politic as an agency to achieve these conditions, there seemed to be a number of points in its favor. Thus, the meeting of the congregation as a whole to consider matters of mutual interest seemed to have the inherent advantage of keeping the attention of each member fixed on the common objective. The free exchange of ideas and the cooperative searching of the Scriptures for specific knowledge offered an excellent opportunity for reaching agreement on the specific laws, offices, and institutions by which that common objective might best be achieved. In fact, when the Pilgrims later gathered together for purposes of public worship, each colonist was, in effect, reasserting his faith in the common undertaking. When they discussed ways and means in open meetings, the congregation as a whole was in a position to uncover possible individual error or disaffection and to employ corrective measures before serious harm could be done. All things considered, the proposed civil body politic promised to be a good arrangement indeed—one worthy of trust and active support.

Anglican Schools

It is the nature of man to want for his children the very best that he can provide. To this end, he works to give them food and a place to live. He guards them from danger and teaches them how to provide for themselves. Above all, he wants them to avoid the mistakes he has made and to take full advantage of the things he has learned. He may take risks with his possessions and even with his life, but he wants to be sure about those things that involve the future of his children. What a man really believes, therefore, is frequently more clearly revealed in what he teaches his children than in what he professes in his public statements.

States and other social groups also reveal their basic beliefs when they fashion their educational agencies. Thus, England under James I maintained a system of schools well designed to perpetuate the concentration of power

and authority in the crown. Education was provided by the established church, and therefore the schools supported the theory that the king ruled by the command and at the pleasure of God. The sons of the privileged few attended one of the great "public" schools. These were generally boarding schools. Admission to study depended upon family connections, though occasionally some boy born in less favorable circumstances was sponsored by a benevolent person with influence. Boys were usually entered before the age of eight and were expected to be able to read and to know the elementary rules of grammar before they were admitted. This primary instruction was not to be had except through private arrangements; and financial ability to provide it, as well as to keep the boy in a public school, depended in large measure upon the family's relation to the crown. Therefore, the financial burden of sending a boy to school tended to keep out of school the children of those who had no vested interest in keeping power in the hands in which it already rested. Furthermore, instruction in the public schools was offered in the classical languages—Latin and Greek—which were by long tradition the languages used by scholars. Upon completion of the preparatory studies, the boy was ready to be enrolled in one of the colleges of Oxford or Cambridge. Here the young man was further fitted to assume his role as an official of the state or of the established church.

It can be seen at once that the educational experience provided the boy of good family served to set him off from the masses by giving him the manners, the attitudes, and the language of the ruling class. Though history shows that the system did not work perfectly, we must admit that it was well designed to instill a deep-seated belief in the divine rights of the king and in the special privileges of the ruling class.

With the education of the ruling class amply provided for, the education of the masses was not regarded as important save for the necessity of teaching them their places. To this end, the established church played a second type of educational role. Staffed by a clergy disciplined to accept and support the existing system, the parish churches offered a means for reminding the masses that by divine command they owed obedience to those whom God had seen fit to place over them. Sermons, no less than the catechism, thus afforded a means of giving *orally* all the instruction the masses were thought to need. No pressing need was felt to offer instruction in reading on anything representing a universal basis. Though the Statute of Apprentices, passed in 1562, and the Poor Law of 1601 had called for some instruction in the elements of learning, these were little more than gestures toward the principle of universal education, and it was not until after 1700 that the monopoly exercised by the Anglican bishops in the establishing of schools and the licensing of teachers was finally broken. That is to say, the Anglican bishops or their appointed agents made educational policy and exercised

control over the schools until some years after the Plymouth settlement was established. There were no local committees, organizations of parents, or even taxpayers' groups to influence educational practices or to determine what would be taught. Parents placed their children in the hands of the schools and were expected to yield to the superior knowledge about matters educational possessed by the authorities who controlled the schools.

Schools of the Dissenters

The close supervision over education exercised by the crown through the agency of the established church made it exceedingly difficult for the dissenters to set up an educational program for their own children. They did so surreptitiously and in clear violation of the law of the land. It was to be expected, therefore, that persons who believed so strongly in the need for teaching their way of life that they risked the penalties of the law by establishing schools of their own in England would lose no time in setting up arrangements for education when they were released from suppression in the wilderness of the New World. The Pilgrims and later colonists in the Bay Colony and in Connecticut amply fulfilled this expectation.

It will be recalled that the Pilgrim's religion invoked his wholehearted acceptance of the Scriptures as his guide for the conduct of life. His school, therefore, had to be of a design suited not only to instill that faith in the pupil but also to help him learn to use the Scriptures as his guidebook. It was this kind of school that was established. In it, the pupils received catechetical instruction as well as instruction in singing the songs employed in the worship services of the adult congregation. But even more important, in light of subsequent developments, they were also given instruction in reading. This reading instruction was intended to enable the young Pilgrim to read his Bible and thereby gain the guidance he would need to conduct himself and his affairs in just and proper ways.

Instruction in reading had Bible reading as its objective from the very first lesson. The letters of the alphabet were taught as the initials of Biblical characters—"A" is for Adam, "B" is for Benjamin, etc. The reading materials consisted of Bible stories and moral lessons based upon favorite scriptural passages. Needless to say, the English Bible was read and the instruction was in English, in sharp contrast to the Latin studies to which the young English gentleman was introduced when he entered one of the public schools.

For most scholars in colonial America, formal schooling ended when they had learned to read by spelling out words. After they left school, the daily Bible reading practiced by adults of that day was expected to, and usually did, improve substantially their meager reading ability. Furthermore,

the Pilgrims, as well as the later colonists, believed so strongly in the power of the Scriptures to guide the thinking of the true believer to reach the right decisions that they made reading ability a virtual requirement for full membership in the congregation, and hence for citizenship in the civil body politic as well. Herein lie the primary reasons for the early and widespread introduction of reading schools in colonial America.

Important as Bible reading was to the English dissenter, he also recognized that in a congregation of individuals so meagerly trained in the literary arts there was great danger of error and misinterpretation. To guard against these dangers, the several congregations were provided with ministers, who, though not officially authorities over the other members, exercised great influence because they had received special training in the languages in which the Bible had originally been written and in theology. Because of their superior training, they were looked upon as interpreters and as sources of information with which to combat error. The training of ministers, therefore, also became an important educational undertaking for the dissenters, and they established grammar schools and colleges for this purpose.

As previously indicated, the Pilgrim, as well as the Puritan who followed him to America, read an English translation of the Bible. Indeed, this was the only language many of them knew. Since various portions of the Bible had originally been set down in Greek, Hebrew, and even older languages, acquiring access to the primary sources became an important matter if the ministers were to be fully effective in their work with the congregations. To this end, the grammar schools which were introduced offered instruction in Latin and Greek.

The first of the grammar schools to be established in America was founded by members of the Massachusetts Bay Colony at Boston in 1636. In the same year the General Court voted £400 to found a college, which, because of the further generosity of John Harvard, became known as Harvard College. Thus, only seventeen years after the Pilgrims landed at Plymouth, a young man aspiring to the ministry or merely desiring the advantages of training in the classical languages and literature had the opportunity to attend both a grammar school and a college. At the grammar school he studied Latin through the major works of Cicero and mastered the elements of Greek grammar. Then he became eligible for admission to college, where he continued his studies in Greek grammar but turned quickly to the New Testament for his text material. Instruction in Hebrew and sometimes in other Semitic tongues was also provided shortly after his admission to college to make it possible for him to read the parts of the Old Testament which originally had been recorded in these languages. All of this language study, supplemented by further literary and theological instruction, was clearly intended to fit selected young men of the colony to

exercise a leadership role. They were to exert their influence by focusing the attention of their fellow colonists on the correct meaning of the rules of life believed by them to have been revealed and set down for them in the Scriptures.

All Education Reflects Adult Beliefs

It is apparent from this review of the facts that both the England of James I and the congregations of dissenters in New England established and maintained the kind of educational program each thought best suited to transmit its particular set of beliefs and customs. The English nobility and clergy thought primarily along educational lines that would guarantee a succession of selected leaders loyal to the crown. The dissenters looked to an education that would make each member of society dependent upon the Scriptures as his guide. Each of the two groups believed with the strength of religious conviction that it had the better form of knowledge to point it to the good life, and each group had turned to education as a means of making its way prevail.

In the same manner, every society designs and operates a program of education. Among primitive peoples, the family and the tribe play the important educative roles. The various aspects of the established way of life are taught by directly involving the learner in adult activities. Religious beliefs are impressed upon the young by means of ritual and participation in the tribal ceremonies. In more highly developed cultures, the school is set up as a special agency to supplement the educational work of the home and the temple. In every case the school is charged with teaching those things which will point the young to the kind of choices which are believed to be best. In this sense, the school is the creation of the society which maintains it. Its unique function is defined by the supporting society and not by those employed to teach. This fact is clearly recognized in every society that directs its affairs on an authoritarian basis, and the schools of such societies are shaped and controlled by those in power. Some of the major systems of authoritarian philosophies and the types of education they have brought forth will be reviewed in later chapters.

The fact that the school is the agency of the society which creates and maintains it is not so clearly understood in democratic groups. The cause of the confusion arises in part from the fact that a democracy derives its forms and arrangements from the people themselves. Thus each generation in a sense is required anew to come to grips with the problem of knowledge and to deal with it in the manner it judges to be best.

The need to be alert at all times to ways in which individual and social arrangements may be improved is an essential and highly important char-

acteristic of the democratic way of life. It follows that democratic peoples charge their schools with responsibility for teaching their children the arts of self-study, constructive criticism, free inquiry, and open-mindedness and the willingness to engage in carefully controlled and responsible experimentation where preliminary studies indicate that it is warranted. Such schools are expected to teach that the purpose of experimentation is not that of lightly committing society to any arrangement that happens to be new but rather of gathering new knowledge in the light of which future decisions may have a better chance to be successful. In addition, the schools are expected to teach that the rights of individuals, both those present and those not present in the learning situation, are to be held up as inviolable. In brief, these values are to be taught because democratic peoples believe *as an act of faith* that present obstacles to the good life can be overcome only when they risk the hazards of change and that the hazards themselves are reduced to a minimum only when change is decided upon through common participation and mutual agreement.

Unfortunately, in playing their proper role, democratic schools may sometimes seem to be assuming responsibility for directing social change itself. Such is not the case. The schools are charged merely with responsibility for transmitting and illuminating the *process* of making decisions—*the only process,* it is believed, *by which a society may safely direct its own transformation*. Further attention will be given this troublesome matter in later chapters.

For the present, it is essential that we restate the two major points already made. First, every society is held together by a common faith regarding the manner in which the future of its members may be made more secure and satisfying. This faith is the very basis of its way of life. Second, each society takes whatever steps it deems appropriate to teach its children what it has learned to hold dear. The more highly developed societies establish and maintain formal educational programs designed to fasten the loyalties of the young upon those things in which their own trust resides. Schools must therefore be regarded as agencies by which a given society tries to win for its children all the good things to which it also aspires.

Thus, it is through the school that a society attempts to realize for its young its own fondest dreams of the life good to live. It seems self-evident, therefore, that before citizens or teachers can intelligently undertake educational reform, much less make a completely new start, it is necessary above all else that they first determine beyond question what is the nature of the faith with which they themselves face their own future.

CHAPTER 3

PHILOSOPHY: SEARCH FOR KNOWLEDGE OF THE GOOD

When the Pilgrims constituted themselves a civil body politic and agreed to refer matters concerning the common welfare to this body rather than to some other agency, they did not of course dispose of the difficulties inherent in making decisions. Their action had determined merely where the decision-making powers should reside. How those powers were to be exercised and how the civil body politic was to distinguish between good and bad decisions were questions that still remained unanswered, and, as the new colony learned very quickly, they were matters that could not be disposed of lightly.

As long as the Pilgrims had resided in England or Holland, most of their daily activities had been regulated by custom and law. These generally had not conflicted directly with Scripture and, therefore, had been given little thought. The matters that had aroused concern had been essentially of a religious nature. Consequently, they had dissented—had rejected the authority of the crown—in the realm of religious matters only and had felt no need to develop a separate system of economic, social, and political forms.

The Need for Knowledge of the Good

The situation in the New World did not permit secular matters to be treated so casually. Here there was no established, ongoing way of life that disposed of the day-by-day activities in a routine manner. There were no laws, no roads, no troops to preserve the peace, no restaurants, no suppliers of fuel, and no real estate developments offering convenient living quarters. Here everything called for decision, and on some matters the Scriptures appeared to offer very little in the way of practical instruction. How, specifically, was the civil body politic to know which "laws, ordinances, acts.

constitutions, and offices" were meet and just? Even in matters such as theft and adultery, on which there were specific commandments, how should the wrongdoers be dealt with?

These and other problems like them quickly became matters of great concern and gave rise to bitter clashes of opinion. The perplexities of decision making weighed heavily on the colonists from the very first days of the new enterprise, and the question of what is right and what is wrong continued to be central in the minds of succeeding generations, as indicated by the literature they produced. The American classic *The Scarlet Letter* is a notable example. In brief, the Pilgrim, like his descendants, learned very quickly indeed that he had a need in his everyday affairs for knowledge more specific and detailed than what he could acquire from a literal reading of the Scriptures alone.

The Pilgrims, of course, were neither the first nor the last people to be confronted with a need for knowledge of the good. Everyone who makes decisions sooner or later comes to feel the need for a rule of thumb, a book of answers, a set of guiding principles, or a process or procedure which can be counted on to lead him to the right choices. Such knowledge is not come by easily, but once it has been acquired it becomes the guide men live by, the guide in which they put their trust. It becomes the chief thing of value to be perpetuated from generation to generation. It comes in time to give form and direction to political, economic, and social arrangements and to determine the basic outline of the prevailing way of life. It follows, therefore, that all men everywhere should give serious and prolonged thought to the question of how they believe they may best come to know what is good. Obviously it is of the utmost importance for teachers to give heed to this matter, since it is their primary duty to transmit to the young the knowledge held to be of the good.

The Meaning of the Good

The beginnings of man's search for knowledge of the good are, of course, hidden in the mysteries that shroud the beginnings of the human race itself. It is reasonable to assume, however, that primitive man, like his descendants today, entertained high hopes for the success of his ventures and feared the perils of failure and misfortune. He came to know the element of uncertainty that seems to be part of life itself. He encountered it in the hunt, on the trail, and around the campfire. When his luck was good, he was fed, warm, and safe. When it was bad, he was hungry, miserable, and fearful. Yet when he recalled the good as well as the bad days, how could he account for the difference? Was he not always the same hunter? Had he not employed the same weapons and skill? Were there, then, factors

other than strength, skill, and cunning which played a part in determining the success of his ventures?

It is not certain how early man accumulated the knowledge and skill which enabled him to satisfy his wants with greater certainty. It is known that in time he learned to trail his quarry and to build snares. He learned to use the skins of his kill to ward off the wind and rain. He came to use stone, wood, and fire to supplement his own strength. In time, father and son, brother and brother, or friend and friend learned to hunt together, thereby multiplying rather than merely doubling the size of the kill that

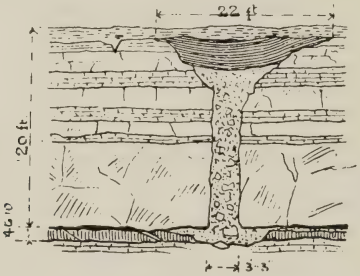

Fig. 5. A prehistoric flint mine. That flint taken from the bed is easier to work than that found on the surface was one of the many items of knowledge passed from generation to generation by primitive teaching methods.

could be had when the individual hunted alone. Each step in this line of development seemed to reduce the probabilities of failure. Each improvement in weapons, each advance in skill became a thing of value, a *good,* and knowledge of that good needed to be passed on from generation to generation.

But the goods about which knowledge accumulated were not all of one kind. Even when the hunter employed his best weapons and techniques, there were days that ended in failure. On the other hand, there were times when rather unpromising ventures brought phenomenal success. How could one account for the differences? Was it because the wind was from the east on one day and from a different direction on the other? Did the failures come chiefly during the dark stages of the moon? Had the hunter not found and worn a feather from the wing of an eagle on the day of his phenomenal success? Had he not imitated the bark of the wild dog immediately before sighting his quarry? True, it may have required a substantial stretch of the imagination even for primitive man to connect any of these factors with

the fortunes of the hunt, but was there not a curious tendency for some of these relationships to appear more frequently in times of failure, and others in times of success? Might there exist causal relationships between things and events which escape casual observation?

Primitive man came to think that there were such relationships. His array of assumed relationships makes up a substantial portion of the superstitions we now associate with primitive cultures. No matter how naïve such beliefs appear when judged in the light of modern scientific knowledge, they were,

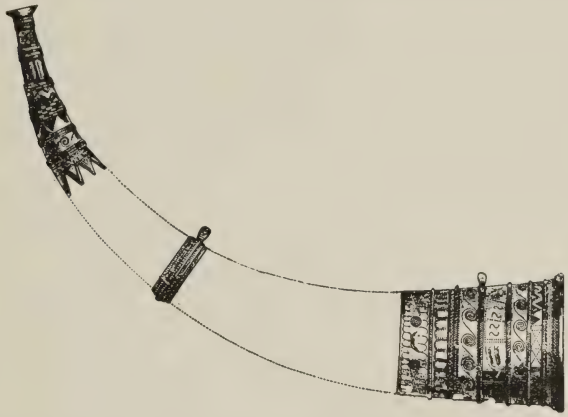

Fig. 6. Bronze horn from the bog of Wismar. Sacred symbols such as these found on tools and weapons were believed to enlist the aid of the supernatural in behalf of those who used them.

for those who held them, *goods* capable of bringing certainty where otherwise there would exist only the perils of blind chance. Each taboo, each charm, and each incantation was prized for its power to control a specific event or condition—for its ability to cause a desired turn of fortune.

Our use above of the terms *goods* and *the good* may have led to some confusion, for like other widely used words and phrases they have acquired a number of specific meanings. Probably *good* is used most frequently to mean moral necessity or duty, as when the parent admonishes the child to be "good." Implicit in this meaning is the obligation to obey a higher authority in the matter of a specified form of conduct. To be good, the child must act in a prescribed way—or, what is more likely, to refrain from doing something that he has been told he must not do. In this sense, the good

lies in conformity, in following the pattern set before him. If any reward is to follow, the child is very likely to identify it as a consequence of his obedience rather than as a direct consequence of the act itself.

But moral necessity, which rewards for conformity and not for the act itself, is not the sense in which we used the terms. It will be recalled that we said that the savage hunted when the wind was right. In doing so, he was not obeying a moral edict—at least not until the original reason had been lost in a rapidly accumulating body of tribal lore—rather, he was doing so because the observance of that practice brought him a bigger bag of game. The act brought its own reward. He came to regard it as good because it paid off directly and he could use it whenever he needed to make sure of a well-fed future.

In this sense, *good* or *the good* can be said to refer to implements, techniques, processes, arrangements, acts, and institutions prized as possessions. They have value because they are the *means* by which we enrich and safeguard our future. They are the instruments and instrumentalities for enhancing human experience.

There is, however, yet another meaning which must be taken into account. As man became more free from the necessity of the moment, he was able to reflect upon his past and to derive from it some guides for the future. He identified certain qualities of experience which he came to cherish and seek for their own sake. For example, when he was in a safe resting place, warmed by a fire, fed, and in congenial company, he felt secure and at peace with himself and the universe. He found it good to feel secure. Thus *security* became worth striving for, even though it was not something that could be held in the hand or bartered for around the watering place. In this particular sense, security is a good, too, but it is good as an *end* in itself rather than as a means to some further end.

We shall skirt, at least for the present, the perennial arguments heard in academic circles regarding the nature and relative importance of means and ends which the preceding paragraph may have raised in the minds of some. Nor shall we attempt at this time to introduce questions about the nature or the real existence of the good such as philosophers have wrestled with for many centuries. For our present purpose, it is enough to point out that terms which denote feelings or qualities of experience, as contrasted to specific acts, implements, and arrangements, may also have reference to forms of the good. Peace of mind, human dignity, happiness, freedom, progress, stability, and similar concepts are terms of this type. As references to general goals or qualities of experience which we seek, they may therefore help us choose which of the various means at our disposal are best in particular circumstances. Perhaps even more important, the end sought may help us to invent new and possibly more effective means than any we already have.

That is to say, the good expressed in the form of a purpose or goal may have a direction-giving influence in our daily affairs, and we have come to speak of these direction-giving concepts as *values*. Thus, with security as his guiding value or objective, man has improved the arrangements and devices employed by his forebears. The spear was discarded for the gun. Agriculture freed him from the uncertainties of the hunt. His community organizations were developed and extended far beyond the confines of the village stockade. In the process, he found that the stockade itself was no longer needed. Today, insurance programs minimize the once crippling blows of adversity, and law-enforcement agencies have relieved the individual of the once burdensome necessities of defending his own life and of protecting his family and possessions.

It should be clear from the foregoing discussion that *the good* may imply moral necessity in one instance, a means or instrument in another, and a value concept or goal in a third. In every instance, however, there is an opportunity implied to choose between things *as they ought to be* as distinguished from how they might be or how they would be if man were not to intervene. Man is believed to be somehow capable of making a difference in this world. He may throw his weight either on the side of things good or on the side of those things not so good. He is called upon every day to make his decisions. But the question remains: How may he know the good from the bad? In this light, *the good* may refer to any or all of the specific meanings indicated above.

It is the broader meaning of *the good* which is intended, for the most part, in the chapters that follow. In a sense it is the meaning implied by philosophers when they speak of *the good, the true,* and *the beautiful*. That is to say, when we speak of the good we refer in general to any or all principles, acts, arrangements, concepts, and purposes which may enhance the quality of our subsequent experience. If in the chapters that follow a more limited meaning is intended in specific instances, it is hoped that this meaning will be made apparent from the context.

The Problem of Acquiring Knowledge

In a preceding paragraph, it was suggested that whenever man is called upon to render a decision that will have bearing upon his subsequent experience he is required to look into the future to see how things *ought to be*. In light of this forward look he is then able to choose from among the present alternatives the one which offers the best promise of bringing about the ends he prefers. It may be said that this is what the Pilgrims did when they made their Mayflower Compact.

Upon closer inspection, however, we encounter the question of how man

is capable of visualizing matters as they ought to be when, in fact, things may never have been that way. From what source does he draw knowledge which goes beyond anything he or any other man has ever experienced?

The problem is similar to that of an artist who is about to begin work on a new canvas upon which he may paint anything he chooses. Before him he sees a landscape which he might copy in minute detail. He may not be satisfied to do this, however, and may omit certain features and add others to make a more beautiful picture. How does he decide what to omit and what to add? Social reformers proceed in much the same fashion. They work for arrangements which do not now exist but which they believe will be better than those we now have. Upon what do they base their belief? The same is true of the scientist who is trying to change the physical characteristics of a metal, of a fiber, or even of the horse. From what source has he derived the pattern which guides his efforts? This is a crucial question, for unless there is the vision of a better future to lead us in the present, there can be no progress. What social arrangements, what forms of security, what modes of conduct are inherent in the good life we seek? So ask those who search for knowledge of the good. But prior even to these questions are the problems of where and how to conduct the search, all of which are questions that challenge the philosopher.

The quest for knowledge of the good is presumably as old as the human race itself. It is still going on all around us today. No matter how advanced our technology, no matter how uniformly we comply with the established conventions, the question remains whether or not we are on the proper course. More than three hundred years before Jesus was born in Bethlehem, Plato discussed this problem and indicated its importance in the following words:[1]

> . . . you have often been told that the idea of good is the highest knowledge, and that all other things become useful and advantageous only by their use of this. . . . Do you think that the possession of all other things is of any value if we do not possess the good? or the knowledge of all other things if we have no knowledge of beauty and goodness? . . . You are further aware that most people affirm pleasure to be the good, but the finer sort of wits say it is knowledge? . . . And you are aware too that the latter cannot explain what they mean by knowledge, but are obliged after all to say knowledge of the good?

Every major philosopher since Plato has recognized that his primary function as a philosopher is, as John Dewey phrased it, "to shed some light on the path ahead." Therefore as educators, it is to philosophy that we must turn when we are faced with the necessity of deciding which aspects of our

[1] From B. Jowett (trans.), *The Republic,* I, in *The Works of Plato,* New York, The Dial Press, Inc., 1899, pp. 254–255.

culture are to be taught to children and which aspects are to be allowed to wither through neglect. For that reason the relationship between education and philosophy is necessarily a very close one.

The Work of the Philosopher

The search for knowledge of the good is not a simple undertaking. If the search is to be more than a haphazard stumbling in the dark, it must be conducted with some attention to establishing a system and to coordinating the efforts of those who engage in it. Thus we find that among those who make philosophy their business the search for knowledge of the good may begin with questions such as these: What is the nature of the good? Is it a thing that has existence, or is it merely an idea that appears in our minds as a result of the gradual accumulation of pleasant experiences? Are there many goods, or is there merely one general good? Where must we look if we wish to find out more about it?

After reflecting upon questions of this type, the philosopher may hazard a few theories in answer to them. These theories, offered in relation to specific questions, are then examined with great care and reformulated as necessary to render them logically consistent with each other. A group or set of such theories which are harmonious and which afford a basis for approaching other more detailed questions may then be called a *philosophical system.* If it attracts a number of philosophers on the grounds that it affords a promising approach to the problem of projecting the good life, it may ultimately become designated as a *school of philosophy.*

For those who have an interest in such matters, it will be worth noting that a given philosophical system usually consists of four major parts.[2] The first part represents the attempt made to define what is real and what must, therefore, be taken into account when we try to put together a theory of the nature of the good. This wrestling with the definition of reality is called the *metaphysical problem.* It involves such questions as: Does reality consist of things material, of things nonmaterial, of both kinds, or of neither kind? Where does God fit into the picture, or is there no need or place for God?

The second part is known as the *epistemological problem.* This calls for an answer to the question of whether or not we may secure knowledge of the reality described in answer to the metaphysical question. Reality is of such a nature that either we may learn about it or it must remain forever

[2] For more detailed descriptions of these matters in nontechnical language, see J. Donald Butler, *Four Philosophies and Their Practice in Education and Religion,* New York, Harper & Brothers, 1951, pp. 12–34. See also Theodore Brameld, *Patterns of Educational Philosophy,* Yonkers, N.Y., World Book Company, 1950, chap. II.

hidden from us. The *skeptic* is one who takes a negative or at least a pessimistic view on this point. On the other hand, if the possibility of knowledge is conceded, the question remains whether such knowledge is to be acquired from sensory experiences, by the rational processes of our minds, through special revelation, or by some other method.

Closely allied to the epistemological problem is the *logical problem,* or the question of how we may make sure that the premises we use and the inferences we draw from them are valid. The efforts made by philosophers to avoid errors as they worked to develop rational systems produced the science of logic. It is in this third area of philosophy that the logicians have attempted to define what type of data may be drawn from the sources designated by the metaphysicists and epistemologists and what kinds of derivations from those data will be acceptable and valid.

Finally, there is the need to project systems of values to give direction to the affairs of men. This is the *axiological problem.* It is here that special attention is directed to defining standards of ethics and morality for the individual as well as for society. In like manner, those who pursue artistic interests search for the meaning of the beautiful, and the pious search for the sublime.

Systems and Schools of Philosophy

The primary problems in philosophy, namely, the problems of metaphysics, epistemology, logic, and values, have troubled men from the time they first began to give thought to their own well-being and to the welfare of their children. They were encountered in elementary form even when those who reflected upon them did not recognize them by the sophisticated names the professional philosophers have since given them. The same problems are difficulties that must be dealt with today whenever a serious effort is made to search for knowledge of the good.

Needless to say, philosophers are no more agreed upon the answers to these problems than are the less sophisticated. They probably never have been agreed and possibly never will be, because to formulate answers in these areas it is necessary to leave the realm of precise, objectively verifiable facts and to hazard a guess or theory. This is by its very nature what one philosopher has called a "leap into the dark." No matter how carefully considered the risk, the decision to proceed on the basis of one system of knowledge rather than another entails in some degree an act of faith. Apparently it is not in the nature of men for all of them to be willing to put their trust in the same set of hypotheses at a given time, for we have now, as we have had in the past, various and conflicting ways of knowing, each of

which invites the loyalties of those who would search for knowledge of the good.

It is by the initial commitment to proceed along a particular line of inquiry rather than some other that the several philosophical systems as we now know them are differentiated. Philosophers are accustomed to speak of the different systems in terms of realism, idealism, naturalism, materialism, pragmatism, positivism, nominalism, and so on. Each system has its own metaphysical basis, which in turn reflects upon the particular meaning of a host of terms and subterms. Precise definitions of these terms are important to the philosopher for they make possible communication, cooperation, and the division of labors.

Unfortunately, philosophers are not generally concerned with the problem of interpreting the results of their speculative researches in terms that the nonprofessional can use. It is for this reason that the educator—whose special responsibility to society demands that he transmit the principles, values, and ideals by which his society lives—frequently may become indifferent if not actually antagonistic to what appears to him to be mere theory. But the teacher, if he is to be effective, dare not be indifferent. Now, perhaps as never before since the beginnings of public education, the teacher needs to know what he is teaching, and the public must make clear what it wants the schools to teach. The need to make clear what we believe to be the very best of all that we know and have is by its very nature a philosophical problem, and teachers and laymen alike are now called upon to give thought to what are fundamentally philosophical matters.

The Need for a Simplified Approach

In our efforts to draw upon philosophical theory to give direction to education and society, we are likely to find that the conventional approaches reviewed above are somewhat discouraging. They require at the outset considerable time and effort devoted to mastering a special terminology and to identifying the technical differences by which the several systems of thought are distinguished. Even after this effort has been made, it may be found that the problems of the educator have been overlooked entirely by some of the philosophers or that some of the systems studied have had little to offer that can be put to use in the classroom. It follows that if large numbers of teachers and laymen are to see their problems in a philosophical light a more direct approach to the matter is needed.

During the search for such an approach, it was noted that philosophers have repeatedly used terms to designate their gross differences which are readily understood by the layman. One of the more easily understood clas-

sifications was suggested by Roger Bacon when he spoke of the three methods by which men say they get knowledge: *revelation, reason,* and *experience.* Others have spoken of *received* and *discovered* knowledge. A somewhat exaggerated modern characterization of the major philosophical systems as they refer to education would have us think of them under the headings of *God-centered, earth-centered,* and *uprooted.* Still another modern classification treats educational theory under the categories of *progressivism, essentialism, perennialism,* and *reconstructionism.*

We may remind ourselves that for our purposes philosophy has been described here as the search for knowledge of the good. It is logical, therefore, that the chief ways men say they acquire knowledge should provide for us our best guide to the study of philosophy in its relation to education. Acting on that suggestion, we find that until relatively recent times philosophers believed that knowledge of the good was acquired either from a source *outside* the world of everyday activities and experiences or from *within* that world. Those who said that knowledge was acquired from the outside also described the methods by which they believed the knowledge was *received* by men. Others assumed that knowledge of the good was brought to light by the activities of man himself within the world of everyday experience, and they described methods by which they believed such knowledge was *discovered.* Much more recently it has been proposed that knowledge is neither received nor discovered but is, in fact, *constructed* by the processes of intelligence out of materials given in experience.

From the standpoint of the educator, it is apparent that if children are to be prepared to *receive* knowledge they will have to be taught differently from those who are being prepared to *discover* knowledge, and that those who are being prepared to use the processes of intelligence to *construct* knowledge will be taught differently from either of the first two groups. Therefore, we shall approach the study of philosophy in its relation to education from the standpoint of (1) systems that assume knowledge of the good is *received,* (2) systems that assume knowledge of the good is *discovered,* and (3) systems that assume knowledge of the good is *constructed.* In the light of considerable study as well as of years of experience in the university classroom and lecture hall, the use of this classification by teachers and laymen, rather than any other classification with which the author is now familiar, seems to be amply justified.

We must remind ourselves once again that this review of the philosophical foundations of education is undertaken in order that we may know better what is at stake in our own times of decision. The historical materials included here will enable us to judge better what consequences are likely to follow from putting into practice a given philosophical commitment. Each philosophical position reviewed here may then be judged in the

light of its probable impact upon the lives of those who may be persuaded to put their trust in it. Therefore, this study will be of greatest benefit if we keep in mind questions such as the following: What is the meaning of the good life if it is not the way of life that brings joy and satisfaction to those who live it? Should we expect our subjective experiences, such as peace of mind, the good will of our neighbors and friends, and the physical comforts afforded by material possessions, to help us know when we are on the right track? That is to say, is it right to judge philosophical theories, educational practices, political institutions, and social arrangements by what happens to the people who adopt them? Should we expect to live better as we learn more about the good life and put that knowledge to use? Or has knowledge of the good nothing whatever to do with the improvement of living conditions today? If our own personal knowledge and experience are not to be trusted as guides to the way we ought to live, whose knowledge and experience shall we use? These and other questions need to be answered if we are to come to grips with the problem of making our lives and the lives of our children worthwhile. Such questions will be central in the discussions that follow.

STUDY AND DISCUSSION PROBLEMS RELATED TO PART I

1. In 1618 the congregation of English religious exiles living at Leyden, Holland (from which most of the Pilgrims came), prepared the Seven Articles to be sent to the Council of England in an effort to gain permission to return to England to live. Compare the assignment of decision-making powers implied in the Seven Articles with those explicitly stated in the Mayflower Compact only two years later. The text of the Seven Articles as well as of the Mayflower Compact may be found in John A. Goodwin's *The Pilgrim Republic* (see Bibliography), as well as in other sources.

2. Compare the text of the Mayflower Compact with the Fundamental Orders formulated and adopted by the Connecticut Colony in 1639. Which is the more mature instrument? What factors do you think may have contributed to this greater degree of maturity?

3. Examine your state constitution and the charter of your city or town to learn how the decision-making powers are defined and where they are located in each case.

4. Examine the charter of your school or college to determine where the decision-making powers are located.

5. Examine the constitution of your student government. Does it locate the decision-making powers in the total student body? If not, why not? Are there persons other than the students who have a vested interest in what students do and learn at school?

6. Search the reference books in your library, such as the various encyclopedias and dictionaries, for definitions of *philosophy* and of the various schools of philosophy. Which of these definitions seem to agree most closely with the description and location of the decision-making powers in each of the several constitutions you examined above?

7. What was the very first school established in your district or territory? What was its curriculum? Who could attend? Who established the school? How did public support and control begin? How was the curriculum of the local school or schools changed when public education was introduced?

8. How did the first schools which were established in American states that had been organized before the Revolutionary War differ from those established in states organized after the war? In what way may the Revolution itself have been connected with this difference?

9. Examine other revolutions in the history of the West with a view to determining how the decision-making powers were at issue in those conflicts.

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Part II

THE THEORY THAT KNOWLEDGE OF THE GOOD IS RECEIVED

CHAPTER 4

BACKGROUNDS OF THE THEORY THAT KNOWLEDGE IS RECEIVED

It was intimated in Part I that the typical community today is not committed consciously and unequivocally to a single, clearly defined philosophy of education or body of knowledge which sets forth the life that is good to live. Whenever the question is raised, different segments of the population are found to have different notions about what is good and therefore what should be taught their children. Some call for the schools to place greater stress on grammar and the literary studies in general. Others extol the virtues of the mathematical branches. Some lay stress on utilitarian facts and skills. Still others beseech the school to give heed to the need for developing social understanding. On the one hand, there is pressure to modernize the curriculum and instruction. On the other, a loud cry is raised in behalf of preserving tradition. In brief, the educational picture today appears confused, and it seems necessary for teachers and laymen alike to acquire perspective on the situation in the hope that a larger measure of agreement may result.

It is with the need for perspective in mind that we now turn to what is perhaps the oldest and most deeply entrenched philosophical tradition in the Western world. We refer to the several theories which rest on the assumption that life in general and education in particular must be conducted in light of knowledge that has come to man by a miraculous process of one form or another. In short, knowledge of the good has come to mean at least to some men that mankind has been saved from the depths of depravity and the treacheries of ignorance only by a gift of knowledge from a superhuman source and that it is now the highest obligation of the teacher to preserve and propagate that knowledge so that it may be made the basis for our common life. This, in essence, is the tradition in Western culture

which we have chosen to discuss as the theory that knowledge of the good is *received*.

Primitive Supernaturalism

We said earlier that the search for knowledge of the good led primitive man into the toils and snares of a burdensome superstition. His every act and aspiration became so entangled in naïve cause-effect relationships that

Fig. 7. Temple of Delphi erected by the pagan Greeks. According to legend Herakles (Hercules) consulted the Oracle of Delphi to learn where he should make his home.

he found it necessary to ensure the success of even the simplest venture with an appropriate rite or incantation. His weapon, his canoe, the sentinel tree, and the neighboring lake came to be looked upon as individual personalities capable of making decisions and putting them into effect. To him, knowledge of the good came to include ways to enlist the cooperation of these and the other aspects of his environment. The inclination to regard one's surroundings as a population of spirit-inhabited beings is now known by the sophisticated name of *animism* and has been described in fascinating fashion by the anthropologists. Its enslaving hand is visible in the mythologies of Greece and Rome and, in a lighter vein, in the lucky coin, the campaign hat, and the rabbit's foot of modern times.

There was, then, even in the dawn of civilization a tendency for man to look beyond his own strength and intelligence for guidance and help in securing his future. The savage turned for help to his medicine man, who was supposed to know the ways of spirits. The early agrarian nations looked upon their kings as men from heaven bearing special knowledge of the good. The tribes of Israel were under the special protection of their prophets and priests, who, it was said, received from Yahweh [1] divine guidance in-

Fig. 8. A Greek citizen consulting an oracle or soothsayer.

tended for the use of His chosen people. Even in Attica, on all important matters the people were in the habit of consulting the oracles, who were said to be in communication with the gods believed to be living on Olympus. In each of these cases, men looked to a super-being or intelligence for knowledge to lead them into the ways that are good.

Naturalism in Greece

By the sixth century B.C., a strong reaction against supernaturalism was under way, especially in the northern parts of the Mediterranean world. The reaction consisted, in the main, of a rejection of the cruder forms of

[1] An ancient name for Jehovah.

animism and an effort to explain the phenomena of everyday experience as purely natural events. Thus, when a boat capsized, the accident was no longer taken as a sign that the occupants had failed to establish a satisfactory working arrangement with the spirit of the waters, but it was simply concluded that the load had not been distributed properly. Similarly, victory at war now was said to result from superior arms and strategy and not from the aid of a god. Under the leadership of Thales, Leucippus, Democritus, and others, there arose a disposition to get along without a

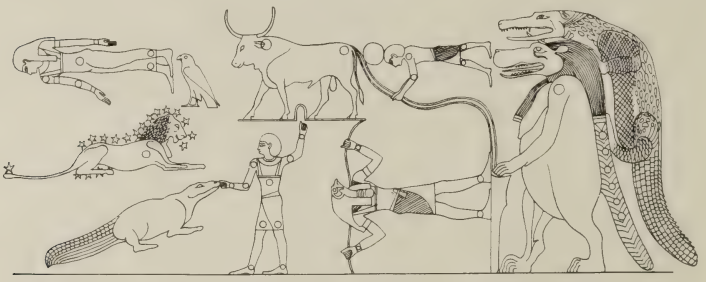

Fig. 9. Chart of the stars in the region of the North Pole. To the early Egyptians the stars of the various constellations outlined the forms of their gods who, they believed, inhabited the sky. From a wall painting in the tomb of Seti I, in the Valley of the Kings. (*Courtesy of the Metropolitan Museum of Art.*)

belief in spirits. Matter, as it came to be understood, was said to have physical properties adequate to account for the nature of all things and to explain all events. This disposition or attitude is called *naturalism* among philosophers. It was much criticized by religionists in pre-Christian times, as it is today, because it does not require a supernatural being to explain how man may acquire knowledge of the good.

We can imagine that the Athenian naturalists were not very devout participants in the festivals celebrated in honor of the gods. Nor did they put much stock in the orthodox versions of the origin of man or in the legend that the sun was really a flaming chariot driven across the sky each day by one of the heavenly beings. In fact, Democritus advanced a theory of matter surprisingly similar to the atomic theory held by scientists at the beginning of the twentieth century. It accounted for change and creation in terms of the movements and different combinations of minute and irreducible cosmic building blocks or atoms.

As a further indication of the drift away from the pagan orthodoxy, Xenophanes drew some startling conclusions about the nature of the gods

worshiped in his day. He found it strange that the gods of the various tribes or races acted, thought, and looked just like the people who believed in them. On the basis of this observation, he concluded that the gods were not

Fig. 10. A Greek vase which portrays an artist painting a statue of Herakles (Hercules) while a heavenly figure directs his efforts. This suggests that the early Greeks, though pagans, looked to another world for knowledge of the good. (*Courtesy of the Metropolitan Museum of Art.*)

real beings but were merely human inventions or man-made myths. We must hasten to add, however, that he did not denounce all belief in the supernatural in his sweeping rejection of the traditional gods; rather, he taught that there is in reality only one god, unlike mortals in form or

thought, who, though moving not at all, yet "swayeth all things by the thought of his mind." [2] No matter how compatible the teachings of Xenophanes may appear to be with modern theology, we must remember that

Fig. 11. Demosthenes addressing the Greek assembly. The role played by the assembly suggests that the Greeks of his time did not depend wholly upon oracles and knowledge said to originate in another world.

in his day he spoke what was called rank heresy by the Greeks who were devout followers of Zeus and the lesser gods.

It is evident, then, that even at the time of her greatest glory, there was in Athens a falling away from the philosophical outlook and religious faith

[2] See B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. I, p. 17.

of the founding families. The success of Athenian armies and the rewards of a vigorous economy had brought great wealth to the city and a luxuriousness to the social life that encouraged a feeling of self-sufficiency. Many leading families found security in their fortunes. There was avid interest in accumulating things and in expanding personal power. Indeed, there were those who believed that Athens had risen to greatness *because* she had neglected the old superstitions. There was, in other words, a *materialistic* trend in high places encouraged at least in part by the naturalistic doctrines spread by the philosophers we have mentioned as well as by a group of professional teachers known as the *Sophists*.

Plato Rejects Naturalism

Athens reached the zenith of her greatness about 500 B.C. She was already well along in her decline when Plato was born in 427 B.C. Her tragic defeat at the hands of Sparta had invited further misfortunes, for, with her military power broken, the barbaric hordes under Philip began pressing down from Macedonia. Who could tell what the future—even the immediate years ahead—might bring? What assurances were there to be had from lands and investments, traditions, alliances, laws, and political institutions if they might be swept away in a moment, as some already had been, by a victorious invader? The times were uncertain. How, then, should one live in order to find comfort and security in the midst of this turmoil? Above all, what had happened to the once proud Athens that she now found herself in such a sorry state?

To all this, Plato answered by blaming the disintegration of Athenian power on the materialistic trend noted above. He accused the citizenry of acting on public matters not in the interests of the state but from self-interest and in the hope of realizing immediate personal gain. Such a condition, he concluded, is inevitable whenever and wherever a democratic form of government gives to the individual of base motives a voice in public matters equal to the voice of the citizen guided by the proper ends. This is true, he said, because individuals who are dependent upon their own efforts to make a living must always be on the watch for opportunities to make a profit. Hence, the thinking of the great body of citizens is dominated by material considerations and is of necessity a shortsighted view. They choose politicians and not statesmen for public office. They neglect the lofty spiritual values on which great and enduring states are built. In short, Plato intimated that Athens had fallen into the hands of "belly men," men who voted for whatever they believed would guarantee them their next meal. He believed that there was no hope for the city until she could be released from the

control exercised over her by the sense organs of these men of low motives.

It may help us to understand Plato's harsh criticisms and strong-handed recommendations for improvement if we remind ourselves that he was the son of one of Athens' oldest and most influential families. His family had never lacked for money or the things that money could buy. As the social life of his native city deteriorated, he learned from bitter personal experience that family fortunes, lordly estates, material possessions, and political institutions are not able to guarantee freedom from the uncertainties of change. Furthermore, it is said that at an early age he came under the influence of a rather odd and mysterious man by the name of Socrates. Unlike Plato, Socrates had never known wealth and had learned to live without it. A legendary figure and one who was out of step with the times, Socrates apparently was repelled by the mad scramble for money and power going on about him. He walked through the streets of Athens telling all who would listen that they were on the wrong track. Instead of material things, he said, they should be seeking justice and righteousness, learning right from wrong, and striving "to open the eyes of the soul to a realm of being that transcends sense."

A Realm That Transcends Sense

It is difficult if not impossible to draw a distinction between the beliefs of Plato and those of Socrates. We have no record of anything that was written by Socrates, and in Plato's works it is usually Socrates who is portrayed as the author of the philosophical ideas presented therein. This and other reasons have led some historians to believe that Socrates was merely a fictitious character invented by Plato to speak the words he dared not speak in his own name for political reasons.

In any event, it is clear that Plato was quite receptive to the Socratic suggestion, given above, that men should look to another world for knowledge of the good. That world, Plato came to believe, is not one which we can inhabit with our physical bodies or about which we can learn by employing our five senses. Rather, it is a nonmaterial realm made up of idea-stuff. In that realm, the various goods exist as *ideas,* perfect in every detail and unchanging for all time. These ideas, he held, have a real existence. They are "things," even though they cannot be seen by the eye or held in the hand. And they are the only perfect things that exist anywhere. Our search for knowledge of the good must therefore be directed to learning about those ideas so that we may be able to imitate them in our everyday affairs.

Plato made clear what he meant by an *idea* in the following words:[3]

[3] B. Jowett (trans.), *The Republic,* I, in *The Works of Plato,* New York, The Dial Press, Inc., 1899, p. 379.

Whenever a number of individuals have a common name, we assume them to have also a corresponding idea or form. . . . Let us take any common instance; there are beds and tables in this world—plenty of them. . . . But there are only two ideas or forms of them—one the idea of a bed, the other of a table. . . . And the maker of either of them makes a bed or he makes a table for our use, in accordance with the idea . . . but no artificer makes the ideas themselves.

Plato went on to say that in the illustration of the bed three beds might be involved. The first would be the idea bed, which exists only in the realm

Fig. 12. Socrates, according to legend, received and drank a cup of poison to carry out the death sentence imposed upon him by the pagan Greeks for teaching heresy.

beyond the reach of our senses. The second would be the bed of wood fashioned for our use by a carpenter who uses the idea bed—as he thinks it is—for his blueprint or pattern. The third would be a picture of the bed of wood painted by an artist. We can see at once that the artist's bed is an imitation of, and a thing far inferior to, the bed of wood. It is in exactly this same sense that the bed of wood is an imitation of, and a thing far inferior to, the idea bed. The example was intended to show beyond any doubt that only the idea bed is real and has true being. All the others, including the bed in which we sleep, are merely imitations.

So it is with all ideas, Plato reasoned. Only the ideas, and not their imitations in wood, marble, cloth, social institutions, laws, contracts, and arrangements, are real and worthy of our notice as we search for knowledge of

the good. Belief in the reality of ideas, and the belief that ideas exist only in a nonmaterial form, is the basis of Plato's *realism*. It is also the basis of what is now known in philosophical circles as *classical realism*. This meaning is a far cry from what is meant when we are called upon today to give thought to *real* things or to be *realistic,* but the contrast serves to emphasize the importance Plato attached to what he described as the realm that transcends the senses.

Plato believed that he had found in the realm of being that transcends the senses the most promising clue to lead us to knowledge of the good. Here, he concluded, is a possibility of becoming independent of the material universe, which offers us only knowledge of imperfect things and arrangements and temporary sense satisfactions. It was the latter, he said, which had lured the naturalists, the sophists, and the "belly men" into their tragic state of ignorance and confusion, out of which had come the downfall of Athens. In contrast, Plato believed that in that other world, that realm above nature, there was to be found the form or idea of each virtue, each value, each good by which men ought to guide their affairs on earth. The world of ideas was for him a realm of absolute perfection, characterized by changelessness and stability. These were the qualities for which he longed in the midst of all the change and destruction that were bringing an end to the way of life his family and their friends had taken for granted for so long.

Plato became convinced that knowledge of the good as it exists in that other realm will surely lead men toward more virtuous conduct and more enduring arrangements. While life here on earth can never be made perfect, it can be made better than it is now. It will become better as men come into possession of knowledge of the good and strive to imitate the heavenly pattern in all their affairs, including their personal conduct and the management of material possessions, economic arrangements, and political institutions. In the matter of political reform, Plato reported that Socrates had asked: "Will they disbelieve us, when we tell them that no state can be happy which is not designed by artists who imitate the heavenly pattern?" [4]

Pagan Otherworldliness

Plato's rejection of the world of everyday experience as a source of knowledge of the good and his insistence that the good exists only in the realm of ideas represent what is sometimes referred to as *otherworldliness*. It directly contradicted the view held by the naturalists and materialists of his day that the good may be found in this world. To many who came after him, the location of the good in that other world tended to convince them that it was futile even to try to improve life here on earth. This note of

[4] *Ibid.,* p. 248.

futility was evident in the beliefs of numerous religious cults that flourished even before Christianity became established as the dominant religion of the West. One of these, Orphism, hinted at a belief in the natural disposition of man to choose evil instead of good and thereby anticipated the later Christian doctrine of original sin. Matter and material things were for the members of this cult quite clearly identified with the forces of evil. They believed, however, that the individual might be liberated from the powers of evil through the miraculous powers of their cult, a kind of faith reinforced by ritual.

Other cults taught of a god who had died and been resurrected, thus establishing a hope of ultimate victory for the individual soul over the body and other things material. It was believed that the individual might participate in that victory if his soul became identified with the god-soul through proper initiation and ritual. However, the victory could come only in escape from earthly life and in a realm beyond earthly existence.

An extreme form of escape from the physical world was taught by the Neoplatonists, especially Plotinus, who believed that the highest good which mortal man can achieve is to lift his soul above the cares and pleasures of this earthly existence and to attain thereby a state of ecstasy. He believed that the properly qualified and adequately trained person could "make the physical world disappear into the nonexistence that is its reality and be at one with God-Light." [5]

The Epicureans also believed that this world is beyond repair. They could not, however, look forward to a blissful hereafter because they were unable to establish any logical basis for a belief in a heaven. Thus they sought escape from the trials and tribulations of this life by ignoring worldly ambition and physical desire, which, they believed, lead only to discomfort and disappointment. They too hoped to attain by their self-discipline a state of serenity unmoved by pain, pleasure, or mental concern.[6]

Hebraic Otherworldliness

The Hebraic tradition, older than Platonism or any of the cults we have mentioned, also pointed men to knowledge that was said to have had an otherworldly origin. It came in time to be a written record, the collected reports of the messages a protecting God had delivered from time to time to His chosen people. The record, preserved to this day, includes the legends of creation, of the origin of the Jews and how they came to be the chosen people, of the rules and commandments delivered to Moses by which the Jews were to be governed, and of the words of wisdom which the prophets

[5] Crane Brinton, *Ideas and Men,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1950, p. 119.

[6] Fuller, *op. cit.,* pp. 196–197.

and priests, according to the record, were inspired to speak from time to time.

The knowledge contained in the writings sacred to the Jews was believed not to be the work of ordinary men but to have been received by them from a realm beyond the reach of mortals. The author was Jehovah, the personal God of the Jews. The knowledge given to them was looked upon as revealed knowledge, and the Hebraic tradition of dependence upon the revealed word will be taken up again in a later chapter, when we shall deal more directly with the nature of revelation.

Christian Otherworldliness

Clearly, the foundations for an otherworldly outlook were securely laid before the rise of Christianity, with which it is now so frequently identified. As Christian doctrine was developed, it came to share the view that the senses and sensory experiences are suspect and the probable cause of much wrongdoing. It incorporated wholeheartedly the attitude that the flesh is not to be trusted and that no permanent reforms can be achieved in this world, even though some Christians later taught that the effort must be made nonetheless.

Along with the outright rejection of the sensory world, Christian doctrine came to assert an overpowering belief in the reality and perfection of a realm that transcends the senses, a realm ruled over by an all-powerful and all-knowing God. Under the influence of the Hebraic tradition, this God came to be pictured as a personal God who looks after His chosen people as long as they are worthy of special attention and protection. It is to Him that mortal man must turn for help and guidance in time of trouble. All good comes as a gift from heaven, and it is to heaven, the dwelling place of God and all that is good, that man must turn if he is to acquire and possess knowledge of the good.

The Platonic-Hebraic-Christian attitude of otherworldliness is so much a part of the Western tradition and is so well known that no further discussion of it is required here for our present purposes. The long tradition of otherworldliness accounts for the fact that Western schools have sought for centuries to educate in an atmosphere that has had amazingly few points of contact with the stream of everyday life and experience. The hopes of righteous men have been fixed on "higher things," and it has been the recognized task of the school to elevate the eyes of the young to the realities beyond the senses and to prepare them to receive knowledge of the good, or, at least, to use knowledge already received by their betters.

We shall now proceed to examine the principal methods by which it has been proposed that men can learn about the good that was said to exist only in a special, nonmaterial realm beyond the reach of the physical senses.

CHAPTER 5

THE METHOD OF REMINISCENCE

It is clear from the foregoing that Plato, like others mentioned in the preceding chapter, assumed all things good to be located in a place to which we have no direct or ready access as mortals. Such an assumption presented an obvious philosophical problem which Plato was quick to recognize. If, as he assumed, the good is in a place beyond the reach of mortal man, how is man to learn what is good and thus acquire the knowledge by which to mend his ways? As will be shown later, this is precisely the difficulty over which Plato's student Aristotle was led to disagree with his teacher and set up a different system of philosophy. It is also the difficulty which has separated some religious bodies, and even some nations, from others.

Plato's solution to the problem seems to have been influenced in part by beliefs predating even the naturalistic and materialistic doctrines which, as we noted earlier, were found in Athens before he was born. It will be recalled that among primitive people life and consciousness are usually explained by assuming that each animate object is occupied by a living spirit, or *animus*. These spirits are given powers to do unnatural things; that is to say, they can act in ways in which ordinary matter cannot act because matter is bound by natural laws, such as the laws of gravity, of cause and effect, and of inertia. In contrast, spirit is unrestricted, as, for example, when the spirit of man is said to travel long distances within the few moments of a dream or when it seems to perform other acts that are impossible when the individual is awake and his spirit is loaded down with the full weight of his body.

Theory of the Eternal Soul

The concept of a spirit, or *soul,* as Plato called it, which occupies the body but is to a degree independent of it, offered him the basis for a solution

to the problem of obtaining knowledge of the good. To his way of thinking, each man is endowed with a soul, which is not subject to the restrictions placed on matter. He saw that among other things the nonmaterial nature of the soul might make it possible for it to travel back and forth between the realm of ideas and the world of sense. Here, then, was an agency that might serve as a carrier of knowledge about the world of ideas to the world of material things.

Proceeding on that hypothesis, Plato assumed further that the soul is eternal, that it has no beginning and no end. In contrast, the body which it occupies while on earth does have a beginning as well as an end. Thus, a man's soul could readily be thought of as having had an existence before he was born and also, quite logically, as having had experiences that predate his present life.

The Soul before Birth

This possibility suggested interesting speculations about where the soul was living before it came to occupy the mortal body. One theory was that it occupied some other body, either that of a human being or of a lower animal. This theory reminds us of the several present-day theories of reincarnation and the transmigration of souls. Plato advanced the theory that at least some of the souls might have dwelt for varying periods of time in the realm of ideas, the realm of absolute good, and that while there they might have acquired knowledge which exists even now as long-forgotten memories within the soul.

The metaphysical and epistemological groundwork for Plato's system of philosophy was now established. In brief, he held that the world of sense with which we are in direct contact throughout our mortal days is a sham, or, at best, a cheap imitation of the world as it should be. Thus, time and effort spent in examining the material universe in search of knowledge of the good, by means of the senses, will lead us nowhere except into further error and trouble. There is, however, a universe of ideas, a realm which is perfect in every detail. Our search for knowledge of the good must therefore be directed away from the world of everyday experiences and into that other world, the world of ideas. This cannot be done while the soul is burdened with the weight of the physical body. But, fortunately, the souls of some men living in our day may have spent a period of time in the world of ideas before they were born into this life. During that preexistence they received knowledge of the good by looking directly upon the idea forms in all their perfection. Knowledge of the idea forms was retained by these fortunate souls, even when they were required to leave the idea realm to be born into their present human form.

We should now be able to see clearly that in Plato's opinion knowledge of the good has a special origin. It is not based upon sensory experience or even on scientific experimentation. Rather, it is derived from a source outside this world and is true and valid regardless of what men may think of it. True knowledge of the good resides only in the souls of our noblest fellow men. It is there that we must search if we are to make progress in improving life here on earth for ourselves and our children.

Knowledge Is Recalled

Some of us may be familiar with the story related by Plato in the dialogue known as the *Meno,* which portrays Socrates using a shepherd boy to prove his theory that knowledge of the good lies hidden in the soul and may be brought to light much as an ordinary experience is recalled in memory. Socrates announced this theory of recalled knowledge to Meno and several other friends one day while they were conversing on a street corner. Meno in particular was skeptical and accused Socrates of trying to play a trick on them, an accusation which Socrates vigorously denied. At that moment Meno's shepherd boy appeared around the corner driving his flock to pasture. Socrates saw his opportunity to demonstrate his point. After having been assured by Meno that the shepherd had never studied geometry and, in fact, was known by him to be completely ignorant of mathematical theory, Socrates called the shepherd to them. Under his skillful questioning, the humble shepherd was led to state the substance of the Pythagorean theorem well known to students of geometry.

When the demonstration had ended, Socrates turned to his friends and asked them how this unlearned person had come to possess knowledge of which they had thought him ignorant. When none of those present could provide a plausible explanation, Socrates said that since no one had taught it to the boy the knowledge obviously must have been within him from the time he was born. This is reasonable, Socrates continued, because the eternal soul receives knowledge during its stay in the idea realm prior to the time it is imprisoned in the body at birth. Knowledge gained in the period preceding birth is not lost but is merely lost to consciousness. It remains hidden within the soul, useless and unknown, until it is brought to consciousness through the process of *reminiscing,* or *recalling.*

The theory that all learning is merely recollection, in the sense that it is the process of bringing to consciousness the knowledge hidden in the soul, was expounded by Plato in some of his other works. He said that recollection is sometimes induced by chance sensory stimulation. Again, as in the case of the shepherd, recollection may be encouraged by a skillful teacher. It was by means of the questions addressed to the shepherd boy that Socrates

brought forth from within his soul the mathematical truth hidden there. This method of teaching by plying the learner with leading questions is still known as the *Socratic method.*

A careful examination of these two methods for inducing recall will reveal their serious limitations. How, for example, may one set up a series of chance stimuli designed to bring forth knowledge of a particular nature? The very nature of chance would preclude the possibility of preplanning successful learning situations. Were this the only method at our disposal, learning would have to be a haphazard, unorganized affair—a most unpromising prospect, indeed.

The Socratic method, based on the probing question, offers somewhat better possibilities. With skillful teachers and a well-designed educational program, each new generation could be brought to possess all the knowledge possessed by the older generation. But this is all that could be brought forth. The limitation arises from the fact that the teacher cannot know what questions to ask unless he already knows what knowledge is to be brought to consciousness. Socrates knew the Pythagorean theorem before he began to question the boy. Therefore, Socrates the teacher learned nothing new in the process, and mathematical knowledge was not advanced by the answers given. All that occurred was that the boy came to know what his teacher already knew before him. The Socratic method might therefore serve as a useful teaching technique but not as a tool for research or for the advancement of knowledge.

Contemplation Induces Recall

Plato had yet a third and more promising method to suggest for inducing the recall of knowledge of the good. This is the method of *contemplation.* He described its nature and potentialities in the parable of the cave.[1] He began by comparing the soul enmeshed in the physical body to human beings chained to the floor of a dark cavern. Here in their inhospitable environment the wretched prisoners could not know the world of light and had to assume that the cave, the chains, and the darkness were the only reality. Then, Plato continued, some fellow creatures built a fire on a ledge behind them, and the flames cast shadows on the wall before them. Now the prisoners assumed the shadows to be real also but still believed that there was no other reality beyond the range of their vision. In time, however, a few became curious and struggled hard enough to succeed in turning their heads around. They now saw the fire and the figures moving before it.

[1] B. Jowett (trans.), *The Republic,* VII, in *The Works of Plato,* New York, The Dial Press, Inc., 1899.

These few thereby came to know that the figures, and not their shadows on the wall, were real. They pulled at their bonds, broke them, and worked their way upward to join the figures on the ledge.

Having reached the environs of the fire and having perceived its nature and the nature of the shadows that were cast, the few who had escaped from the floor of the cave now thought they had found true light. They were mistaken, Plato wrote, for in a far corner of the cave was a tunnel slanting steeply upward. At its upper end was an opening which admitted a few bright rays of sunlight. By comparison, the fire in the cave now looked dim and like a mere shadow of the light outside the cave. Here and there a creature moving about the fire became curious and was stimulated to want to reach the brighter light. But the way was rough and steep. Many who attempted the ascent gave up the effort and turned back, preferring the darkness of the cave. Now and then, however, someone persisted in his desire to know that brighter light and ultimately stumbled out into the bright world of reality. Though the contrast between the darkness of the cave and the light of day was at first painfully blinding and confusing, those who persisted soon became adjusted to the light and were able to see things as they really are. They came to know the superiority of the world of light to the world of darkness, and they came to know the cave for the mere shadow of reality that it is. They were now able to tell the people still chained in darkness or tending the fire on the ledge how miserable and inadequate was their existence. They were now able to lead the prisoners of darkness into the pure light of true being.

Plato depicted Socrates using the parable to impress upon his listeners the misleading nature of the senses. The man who depends only on his senses was said to be like the prisoners in the cave who perceived only the shadows of things. It is not until man learns, through the hard struggle upward, to renounce the shadows and to look upon the real things outside the cave of darkness that he will be able to walk in true light. It is not an easy matter for man to throw off the power which the senses have over him. But the effort must be made if the soul is to be set free. The man who has walked in the pure light of day can then return to the cave of darkness, carrying with him knowledge of the world of light. He is no longer dependent upon the impressions his senses bring him from within the cave. A soul so liberated from dependence on the senses can thereafter look within itself for the memories of the world of light which are stored there.

The search within the soul for knowledge of things good, true, and beautiful is what Plato meant by *contemplation*. By this systematic search on the part of liberated souls it was expected that new knowledge—knowledge not previously recalled by anyone else—could be brought to light.

Therefore, it was to contemplation that Plato looked as the most promising road to knowledge of the good; and it was upon this theory, as we shall see in the next chapter, that he based his plan for education.

Theory of Class Differences

There was a second lesson hidden in the parable of the cave. It will be recalled that many of the prisoners preferred to accept their chains and to live in darkness even after they had been told that there was a better life available to them. Some simply would not make the effort to turn their heads toward the fire to see for themselves but preferred to believe that the shadows were the real things. Others, having turned toward the fire, found the light painful to their eyes, which were accustomed only to darkness. Most of these also turned back to the shadows rather than endure the pain. Those few who did endure the pain for the sake of ascending to the ledge soon found that their eyes became adjusted to the light and that they were now able to enjoy the light cast by the fire. They now preferred the lighted ledge to the dark cave. In similar fashion, only a small fraction of those on the ledge were later willing and able to make the effort to work their way out of the cave. But Plato made it clear that only the very few who did so ultimately came to know and to love the ways of the world of true light.

The differences in the behavior and ultimate success of the inhabitants of the cave illustrate the differences Plato believed typical among the members of the human race. He did not believe that all men are born equal or that each has equal access to knowledge of the good. On the contrary, he said that the vast majority of men are by their nature attracted to sensory delights and physical objects. They are like the prisoners in the cave who preferred to believe that the shadows were the real things and were therefore unwilling to turn away from them. They are the "belly men," the men of clay, who have no love for knowledge of the good. It might even be said that their souls never dwelt in the realm of ideas before being born into this life. Hence they have no knowledge of the good within them to be brought to light by contemplation. That is to say, they are incapable of engaging in contemplative activities and always will be incapable of doing so. They will never produce knowledge useful in setting society on the right road. Hence, in all fairness to everyone concerned, they should never be permitted to exercise authority over anyone, not even over themselves. Instead of rulers or even citizens with a vote, the people of clay should be herdsmen, tillers of the soil, craftsmen, laborers, servants, professional musicians, and other types of workmen whom Plato regarded as menials. In the ideal state they should not be permitted to labor in pursuit of purposes which they themselves have formulated, because such purposes would always be imita-

tions of the shadows in the cave of darkness. They should be permitted to labor only to attain purposes set by others. In this sense, they should be slaves always, even though their legal status need not necessarily be so defined.

Somewhat above the clay people, Plato identified a small group which he labeled the people of silver. Of this group it could be said that their souls had spent but a little while in the realm of ideas before they were born into this life. In that brief experience, they had been able to sense the general state of order and harmony which governs all things in the idea world, but they had not been able to learn the detailed nature of single ideas themselves. The people of silver therefore might be compared with the prisoners in the cave who had broken their chains and had come to prefer the light of the fire on the ledge to the darkness of the cave itself. They were able to distinguish between the shadows and the real objects which cast the shadows. The people of silver, therefore, could correct some of the errors of the people of clay even though they never walked in the realm of true light themselves.

From the class of silver people, Plato proposed to recruit the overseers, the supervisors, and the administrative and executive personnel necessary to supervise the operation of his ideal state. However, these people would not make basic policy but would be responsible merely for putting into effect the policies formulated by others.

Although the class of silver people was said to be a very small group when compared with the people of clay, there was above them a class much smaller still. This last group was made up of those whom Plato called the people of gold. These were the individuals endowed with souls which had dwelt for long periods of time in the realm of ideas and, therefore, had brought a rich cargo of true knowledge with them when they were born into this life. Theirs were the souls which the state would be well rewarded to train in the ways of contemplation, for it was from them that the knowledge of the good life was to be brought forth.

In the parable of the cave, the individuals who had within their souls an unconscious memory of the world of light were led to struggle out of the cave by that faint memory, which was awakened when they saw the light at the mouth of the tunnel. These few and only these few were willing to make the sacrifice in effort and to endure the pain caused by the unaccustomed brightness as they approached the source of true light. They cared not for the scorn of their fellows who knew only the shadows, and in due time they came to know once again the reality which had been hidden from them for so long. These, the men who harbored memories deep in their souls, were the ones who were ultimately liberated from the chains of darkness and came to know true being.

The Good Society

When Plato took up the task of outlining what he believed would be the ideal state, he made it clear that it should be governed by the members of the gold class only. It was only they whom he believed capable of recalling the knowledge by which men might be led to return to the ways of wisdom and righteousness. They were to be his philosopher-kings, the guardians of the state who were to formulate and pronounce the policies which the other two classes were to put into effect. He insisted, therefore, that to them must be delivered absolute powers of government, unlimited by a constitution and unhampered by legislative bodies drawn from the two lower classes. Possessing superior knowledge and guided by an overwhelming love of truth, these guardians, he believed, would look after the well-being of the other classes much better than they could look after themselves, as they would be required to do if they were allowed some form of self-government. Plato concluded: [2]

> And this was the reason why truth forced us to admit, not without fear and hesitation, that neither cities nor States nor individuals will ever attain perfection until the small class of philosophers whom we termed useless but not corrupt are providentially compelled, whether they will or not, to take care of the State, and until a like necessity be laid on the State to obey them; or until kings, or if not kings, the sons of kings or princes, are divinely inspired with a true love of true philosophy.

Plato was not willing to turn over the powers of government to his guardian class without some safeguards. He recognized the danger that human nature might lead even his philosopher-kings to compromise in extreme circumstances. His safeguards were designed to protect them from these temptations.

Among the strongest temptations to which men are subjected is the inclination to put self-interest above the good of society. Plato put his guardian class beyond the reach of self-interest by making it impossible for individual members to gain or lose material benefits or personal advantages as a result of any decision which they would be called upon to make. To this end he denied them the right to own property or to engage in gainful pursuits. They were to be a class set apart from the rest of society, owning no property but having all their wants supplied at public expense. They were to live in dormitories, have their meals served in a common dining room, and, in general, live as members of a communal society. Therefore, no decision they might be called upon to make could result in an increase or decrease of their supply of material goods and comforts. There was to be no

[2] *Ibid.*, p. 246.

opportunity for any of them to make a quick profit through any questionable transaction.

A second temptation which frequently leads men to compromise in matters of state is the natural interest parents have in the well-being of their children. Family pressures, as Plato well knew, have led many persons to act against the best interests of society. To protect his philosopher-kings against this type of pressure, Plato denied them normal family life. No man or woman who was a member of the guardian class was to be permitted to establish an individual household. None would be permitted to contract an enduring, monogamous marriage. Though they were expected to reproduce, the offspring of a gold-class union was to be placed at once in a state-supported orphanage. Here each child was to be treated as every other child is treated, and no parent was to be permitted to know his own child. In this way, the rulers of Plato's ideal state would never be under the temptation of appointing relatives to key posts when better qualified persons were available.

It should be clear that Plato did not intend the men of clay and the men of silver to have a voice in matters of state. Thus his ideal state was not to be encumbered with the modern paraphernalia of popular government, such as stated elections, representative legislative bodies, and constitutional guarantees. According to Plato, such provisions as these were unnecessary because the philosopher-kings would always work only for the best interests of all. Their judgments would be of the highest order in all things, and Plato believed that it would be foolish indeed to have their decisions, based as they would be on true knowledge, subject to review by persons who were guided only by knowledge of the shadows on the wall.

Thus, according to Plato, when the philosopher-kings are in power everyone benefits. This is the practical, political side of the Platonic faith. The people who share that faith today can be expected to look around to find the men of gold in whom they can place their trust. To that end, a systematic search must be conducted—a task which Plato assigned to education. We shall now take a look at his educational system.

CHAPTER 6

LEARNING TO RECALL KNOWLEDGE

Few, if any, philosophers have exerted a greater influence than did Plato in shaping the form and content of education in the Western world. It was he who set forth the first clear, comprehensive statement defining the social role of education as well as the manner in which he thought that role should be played. He gave us precise descriptions of what he understood to be the nature and source of knowledge of the good, the nature of man, the psychology of learning, and the effective curriculum. Later, many of his theories, and especially those on education, were absorbed into the body of Christian beliefs and practices. Ultimately, when both Catholic and Protestant bishops came to exercise monopolistic controls over the teachers and the schools within the areas under their jurisdiction, some of the Platonic ideas became deeply entrenched. It is to Plato that we must turn, therefore, if we are to understand the theoretical foundations on which a great portion of Western education was built and on which a substantial part rests to this day.

Plato's Educational Assumptions

We saw in the previous chapter that Plato employed the doctrine of reminiscence to explain how man acquires knowledge of the good. His theory rested upon the following very specific and basic assumptions. First, ideas are the only real forms of the good. They have an existence of their own as distinguished from the existence of sensory objects. The assumption that the good exists only in the form of ideas in a world of their own is the reason why Plato came to insist that knowledge of the good must originate in the realm of ideas. Second, ideas are not apparent to the physical senses. Therefore, knowledge about them cannot be acquired from sensory experiences. Since ideas cannot be known by the body, knowledge about them

can come only through the agency of a nonphysical mind, or soul. The soul, Plato assumed, is eternal. Third, the soul at birth already has within it the knowledge we seek. This was made clear by Socrates in his demonstration with the shepherd boy. Finally, knowledge of the good is acquired by bringing to consciousness the impressions received by the soul before it was introduced to this life. Developing the ability to bring to consciousness the knowledge hidden within the soul is what Plato assumed to be the main role of education.

Education as Mental Discipline

It is clear from the above that Plato totally rejected the theories taught in his day by the Sophists, who claimed that teaching is "an instilling into the minds from without." In contrast, he insisted that knowledge can be acquired only in the sense that teaching helps bring about a "revelation to the soul from within of principles grounded in her essential nature."[1] Plato's educational interest was therefore directed to finding a way to make the soul capable of prospecting within itself for the hidden knowledge and ultimately to be able to do so without having to depend either upon a teacher or upon chance. He found his solution in the soul's powers of contemplation.

In essence, the ability to contemplate was said to mean that the soul is capable of focusing upon knowledge which already has been recalled by chance stimulation or otherwise, and, by manipulating this knowledge, by trying various arrangements and combinations, to make new knowledge come to consciousness. Knowledge of the good, then, can be developed and enlarged upon by systematic and persistent contemplation; and to education, Plato said, falls the task of developing and encouraging the contemplative powers.

Plato made it clear that the ideas of which we must seek knowledge exist together in their very special realm in a state of perfect harmony. There is among them no discord, no contradiction, and no struggle for status. Harmony is maintained, he said, by the pervading influence of the idea of the good. We may conclude, then, that when in our contemplations we bring forth opinions and beliefs which are discordant and contradictory we are not in possession of true knowledge. The discovery of inconsistencies in our system of beliefs should therefore cause us to look further until our views are consistent and harmonious in all their parts.

It follows that harmony and logical consistency can be taken as a kind of test by which we may judge whether or not our thoughts are accurate

[1] B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. I, p. 86.

memories and whether the ideas we recall were observed correctly by the soul in its preexistence. Thus, in developing the contemplative powers, the teacher must watch for two things. First, the soul of the pupil must be turned from physical objects and material interests to the realm of ideas. Second, the soul must develop a feeling for the harmony which is a quality possessed by all genuine ideas and, hence, is apparent in all true knowledge of them. In both instances, it is the soul and not the physical senses that is the object of the teacher's attention.

Education, then, has to do with the soul and must be of such a nature that the soul will function more effectively in the recollecting role. It is essential to point out once more that in Plato's opinion education does not put knowledge into the soul but merely conditions or *disciplines* the soul to engage more adequately in the contemplative activities.

The Training of Children

In projecting a suitable plan of education, Plato surveyed the kinds of teaching that were in vogue in his time. He took note of the reading schools, the dancing schools, and the singing, or music, schools and agreed that these are acceptable for the young child. Certainly, the young should learn their letters, and for this purpose the reading school was necessary. Also, since children were boisterous and unruly creatures, the dancing school might teach them some order and self-control. The singing schools of Plato's day taught the history of the people chiefly through legends and epic poems. These works, Plato felt, should be used to foster moral and spiritual values, and to this end he urged that the materials be severely censored to delete all references to immorality and unworthy acts and purposes.

Plato was quick to point out that the early forms of schooling made little if any direct demands upon the soul's contemplative powers. They could not, therefore, be called education in the sense in which he used the term. He regarded them merely as convenient and perhaps necessary forms of preliminary training before the child is ready to begin his real education. Education proper, he believed, should begin about the time the child enters the period of adolescence.

The Preparatory Sciences

What, then, of all that Plato had to choose from did he find suited for his system of education? To this question he responded by recommending the science of *arithmetic* as the first subject of study for the prospective young citizen. His reasons were summarized as follows: [2]

[2] B. Jowett (trans.), *The Republic,* VII, in *The Works of Plato,* New York, The Dial Press, Inc., 1899, pp. 277–281.

It appears to me to be a study of the kind which we are seeking, and which leads naturally to reflection, but never to have been rightly used; for the true use of it is simply to draw the soul towards being. . . . I mean to say that objects of sense are of two kinds; some of them do not invite thought because the sense is an adequate judge of them; while in the case of other objects sense is so untrustworthy that further inquiry is imperatively demanded. . . . [For instance] if simple unity could be adequately perceived by the sight or by any other sense, then, . . . there would be nothing to attract towards being; but when there is some contradiction always present . . . then thought begins to be aroused within us, and the soul perplexed and wanting to arrive at a decision asks, "What is absolute unity?" This is the way in which the study of the one [as in numbers] has a power of drawing and converting the mind to the contemplation of true being . . . and this being true of one must be true of all numbers. . . . [Since] all arithmetic and calculation have to do with numbers. . . . And they appear to lead the mind towards truth. . . . Then this is knowledge of the kind for which we are seeking, having a double use, military and philosophical; for the man of war must learn the art of number or he will not know how to array his troops, and the philosopher also, because he has to rise out of the sea of change and lay hold of true being. . . .

Plato's reference to the military value of arithmetic was a recognition of the fact that in a society which is supported by a slave population only the free citizens can be depended upon to be willing to defend it. His philosophers, therefore, must be soldiers, too. But military pursuits were looked upon as a kind of necessary evil, and the study of arithmetic for military use was believed to have no value in developing the contemplative powers. The same might be said for the gymnastics and military games in which his young scholars were to engage.

Nor did he have a good word for that form of arithmetic which has to do with "merchants or retail-traders, with a view to buying and selling." Indeed, Plato recognized that the applications of arithmetic are numerous, but he said it had value as a study only "if pursued in the spirit of a philosopher, and not of a shopkeeper." In this abstract form, with the "visible or tangible objects" eliminated from consideration, arithmetic, the science of numbers, would compel "the use of the pure intelligence in the attainment of pure truth." Therefore, the study of arithmetic must be pursued by the future "principal men of the state . . . until they see the nature of numbers with the mind only."

We recognize, of course, that Plato meant to realize from the study of arithmetic the kind of mental exercise or discipline which more recent educators sometimes have associated with the study of algebra. The algebraic equations and forms of calculation are, indeed, stripped of visible and tangible objects, and the attention of the student is drawn to the nature of numbers. Their relationships are shown to be harmonious and are always

so as long as they remain in the abstract. Algebra in its traditional form therefore has been valued for a long time as a study which compels the use of the pure intellect, and its laws and axioms have frequently been looked upon as forms of absolute truth.

Of course, Plato had never heard of algebra. He merely wanted a study which approximates what we know as the science of numbers to be the first subject studied by his young scholars after they had completed their primary schooling. He indicated the following chief reasons why arithmetic should have first place in the plan of education: First, it had practical value as an aid to the professional soldier. Second, it was in a sense more nearly universal as well as more elementary in its nature than the other sciences and, therefore, was better suited as the first of the educational disciplines to which the young were to be subjected. Third, by directing the mind to contemplation of the true nature and harmony of numbers, the study of arithmetic made a beginning in developing a feeling for the harmony of ideas by which the mind might later recognize true knowledge of the good.

The second science Plato recommended was the "kindred science, *geometry.*" Like arithmetic, geometry was admitted to have a certain military value, "for in pitching a camp, or taking up a position, or closing or extending the lines of an army, or any other military manoeuvre, whether in actual battle or on a march, it will make all the difference whether a general is or is not a geometrician." [8] But as in the case of arithmetic, the military value was of secondary consideration, for the real question was whether geometry "tends in any degree to make more easy the vision of the idea of good." Plato held that it did so when properly taught. But if it was to be properly taught, it must be purged of the practical view introduced by the Sophists, who were always speaking "in a narrow and ridiculous manner, of squaring and extending and applying and the like," as though the necessities of geometry arose from daily life. When geometry is made to aim at "knowledge of the eternal it will draw the soul towards truth, and create the spirit of philosophy."

We need only turn to the geometrician's definition of a point, a line, or a circle to see how theoretical geometry escapes from the realm of the senses and everyday life. A point by definition is without length, breadth, or thickness. It has only location. It cannot be seen, felt, or represented in physical form, for all physical objects have these dimensions, no matter in how small a measure. A point can be real, therefore, only in the sense of an idea, of a nonmaterial thing. The same holds true of lines and circles, which merely describe the path a point might follow in a given plane. They may, therefore, be said to have length but not breadth or thickness and for that reason are also incapable of having a physical being. They,

[8] *Ibid.*, pp. 282–283.

too, can only be "thought," a condition that holds equally true for all geometrical forms and figures.

The study of geometry, therefore, has the virtue of leading the mind or soul from the objects of sense to the objects of true being. But it can do more than this; for in the contemplation of the true geometrical forms, their harmonious qualities are observed. An angle that exists only in thought may be bisected perfectly, but a constructed angle cannot be so bisected, for the imperfections and limitations of our drawing instruments will produce inequalities no matter how slight. The qualities of harmony and perfection will be observed in all geometrical relationships, and it was said, therefore, that their study would promote the feeling for harmony and the love for pure truth which Plato's education was designed to develop.

Plato made it clear that he would include the study not only of plane geometry but of solid geometry as well. The latter was not well known or highly developed in his day, but he felt that it had possibilities as a discipline of the kind he wanted, and he urged that it be developed for that purpose. It was clear to him also that because of their respective natures the study of plane geometry should precede that of solid geometry, a sequence that has been respected in practice to this day.

The selection of *astronomy* as the third subject in the curriculum appears to have aroused some surprise among Plato's contemporaries. After building such an excellent case for the contemplative aspects of arithmetic and geometry, and after cleansing these studies of all "visible and tangible objects," he seemed now to be turning to an area in which the visible and the tangible were the sole objects of study. But Plato reasoned otherwise: [4]

> The starry heaven which we behold is wrought upon a visible ground, and therefore, although the fairest and most perfect of visible things, must necessarily be deemed inferior far to the true motions of absolute swiftness and absolute slowness, which are relative to each other, and carry with them that which is contained in them, in the true number and in every true figure. Now, these are to be apprehended by reason and intelligence, but not by sight. . . . The spangled heavens should be used as a pattern and with a view to that higher knowledge; their beauty is like the beauty of figures or pictures excellently wrought by the hand of Daedalus, or some other great artist, which we may chance to behold; any geometrician who saw them would appreciate the exquisiteness of their workmanship, but he would never dream of thinking that in them he could find the true equal or the true double, or the truth of any other proportion.

From this and subsequent statements, it is apparent that Plato had no interest in the study of astronomy for purposes of navigation or to measure time or predict the seasons. Let the heavens alone, he admonished, and give attention to the harmony and perfection of true motion.

[4] *Ibid.*, p. 287.

Just as astronomy is concerned with the harmony of motion relative to the eye, so also, Plato said, there is a form of motion relative to the ear. This is the science of music, or *harmony,* as Plato called it. Again he ridiculed those who taught harmony by comparing the "sounds and consonances which are heard only," for their labor, like that of astronomers, was in vain. Like the Pythagoreans, "they investigate the numbers of the harmonies which are heard, but they never attain to problems—that is to say, they never reach the natural harmonies of number, or reflect why some numbers are harmonious and others not." [5]

The science of music, if properly taught, was also said to lead the soul from the realm of sounds and the plucking of strings to the realm of true harmony. This type of study had nothing to do with entertainment, amusement, or the skills of the professional musician. (Incidentally, this last was, in Plato's opinion, an occupation fit only for slaves and similar persons of inferior nature.) He wanted his scholars to study music on a strictly intellectual plane, and music studied on a strictly intellectual plane suggests to us the theory of music. The nearest approach to it among the subjects offered by modern schools of music is still identified by the name *harmony.*

It should be clear by now that by the *sciences*—arithmetic, geometry, astronomy, and music—Plato meant something quite different from what we mean today. Scientific studies are likely to bring to our minds visions of laboratories, microscopes, foul-smelling biological specimens, and, above all, a hardheaded, practical attitude that bodes ill for theory and idealistic aspirations. Science is now looked upon as having to do with the problems of agriculture and industry, with the splitting of molecules and atoms, and with the harnessing of the resulting energies for a myriad material uses. Not so for Plato. To him, the practices, skills, and processes by which one cultivated a particular field of endeavor was an *art.* Art, like agriculture, or weaving, or navigation, involved doing and practice. Science, on the other hand, involved knowing, theory, and contemplation. Scientific studies, in Plato's judgment, would lead to knowledge of the good, whereas the pursuit of the arts would not. His meaning for "science," therefore, was similar to the meaning we associate with "philosophical inquiry" today, and his reference to "the preparatory sciences" pertained to studies that would prepare for philosophical pursuits in later life.

Higher Education

The sciences so far named by Plato have not dealt directly with contemplation of the good, in the sense that we do not derive from them the knowledge that is to point us to the life good to live. This last is the role

[5] *Ibid.,* p. 290.

to be played by the queen of all the sciences, *dialectic*. According to Plato, "The power of dialectic alone can reveal [absolute and final knowledge of the good], and only to one who is a disciple of the previous sciences." [6] Thus, while dialectic, or philosophy, is the only one of the sciences that "goes directly to the first principle . . . she uses as handmaids and helpers in the work of conversion, the sciences which we have been discussing." [7]

Fig. 13. A school of philosophy in Athens as portrayed by Raphael. Such schools were founded by various Greek philosophers and later were imitated in Rome.

The preparatory sciences, therefore, were intended by Plato to serve as a form of mental exercise or discipline to put the soul in better condition to perform its contemplative role. They were to provide preparatory training and were to be undertaken by the young—a role, incidentally, which some people insist is the only proper one for secondary schools today.

Plato believed that only when these preparatory studies had succeeded in turning the soul from darkness to light and had developed in the soul a feeling for the harmony of ideas, and when sufficient maturity had been achieved, would selected individuals be ready to undertake the study of the

[6] *Ibid.*, p. 292.
[7] *Ibid.*, p. 293.

science of dialectic. This was to be the highest as well as the final discipline provided by his system of education. "No science can be placed higher—the nature of knowledge can no further go." [8] Beyond the formal study of dialectic Plato said there extended only the realm of applied dialectic—that is to say, contemplation undertaken deliberately for the purpose of recollecting the knowledge hidden in the soul. This was the work of adults who labored in the best interests of all. This was the role to be played by the guardian class.

Transfer-of-training Theory

The disciplinary role of the sciences should now be clear. Scientific study was not intended by Plato to fill the mind with useful information. Rather, it was intended to do something to the mind, or soul, itself. Thus, the disciplined mind would be better prepared than the undisciplined mind to recall and apply useful knowledge after the period of formal education had been completed. It should be noted that the acquisition as well as the application of the knowledge at which the educative process was aimed was thought to come after the student had completed his education. Education was, therefore, a preparation for life and not life itself.

This point may be clarified if we turn for a moment to Plato's theory of the transfer of training. After reciting the virtues of arithmetic in support of his decision to include it as the first science in his program of studies, he called attention to its immediate benefit to the student in the following words: [9]

> And have you further observed, that those who have a natural talent for calculation are generally quick at every other kind of knowledge; and even the dull, if they have had an arithmetical training, although they may derive no other advantage from it, always become much quicker than they would otherwise have been?

A similar virtue was claimed for geometry, for, "as experience proves, anyone who has studied geometry is infinitely quicker of apprehension than one who has not." [10]

The improvement of mind, therefore, was not restricted narrowly to the field of science in which the mind had been exercised but was said to be a general benefit that would become apparent in all forms and fields of application. If this is true, and Plato believed that it was, the study of mathematics should prepare students just as well for future careers in agriculture,

[8] *Ibid.*, p. 294.
[9] *Ibid.*, p. 282.
[10] *Ibid.*, p. 284.

commerce, or politics as for careers in philosophy. The benefit in the form of quickness of wit and of apprehension gained from the study of the preparatory sciences was thought capable of being transferred to any area of life in which problems are encountered. The Platonic sciences, therefore, were said to afford a *general education,* in the original meaning of that term. One who had pursued them to a degree sufficient to turn his mind from darkness to light was said to have been liberated or to have received a *liberal education.* This theory of education is still with us to some degree in that form of education which we label the *liberal arts.*

The Selective Role of Education

The preparatory sciences had yet a further educational value in Plato's opinion. From his belief that mankind is divided into three distinct classes, there arose the necessity of determining where each person belongs and of putting each in his preordained place. Only when each knows his place and performs the work that is proper for his station can justice and virtue be made to prevail.

Infants are not born with the mark of their class upon them. It becomes necessary for the good society to sort out the gold, the silver, and the clay people in each generation, and each must be prepared to play his proper role. It was thought especially important for the state to locate the people of gold and to prepare them for their contemplative activities.

It was intimated in the parable of the cave that those prisoners of darkness who possessed some faint memory of the world of light were the ones who were attracted to the light and ultimately overcame all the obstacles which had held them captive. Only a very few were said to have such memories, and hence but a few escaped from darkness. So also with the souls of men in this world. Only a few have knowledge of the good hidden away, and, therefore, only these few are capable of becoming contemplative individuals. The educational system must find these few and turn them to their proper work.

The selective function of the preparatory sciences becomes effective, Plato believed, when the pupils occupy themselves more and more with the contemplation of ideas in their pure form. Those who have memories of the idea realm will find these contemplative activities pleasant and will, for that reason, be attracted to them. Those who have no such memories will be repelled by the sciences and will prefer the ways of darkness. Thus the sciences, in addition to providing discipline for the minds of those who pursue them, will also tend to discourage the unfit. The latter will want to withdraw from the place of instruction and will ask to be permitted to join in the mundane affairs of the world. Let them go, Plato advised, for it will

profit neither them nor the state to keep them in school any longer. They are the people of clay and of silver, who are not endowed with the attributes essential to those who must rule. Schooling is intended to eliminate the unfit just as much as it is intended to locate the fit, and to this end the sciences must never be modified or made easy to accommodate those who find them distasteful.

Nor should the youth be compelled to attend the schools. Let each have his chance, Plato said, but let the instruction "be a sort of amusement; you will then be better able to find out the natural bent." In this manner, only those who have natural talent for contemplation will be attracted to their studies. Furthermore, compulsion is not a fitting condition for those who are to become the future rulers of the state. Theirs are the souls not of slaves but of free men. They cannot become free and acquire the attitudes of a liberal mind if forced to do the bidding of others, even when it is their teachers who do the bidding.

Summarizing briefly, we may assume from the foregoing that if Plato had been privileged to set up the school system for his ideal state he would have concentrated upon that part of education which follows the elementary training in reading, dancing, and singing. He would have provided for these older boys and girls a program of studies consisting only of arithmetic (or later, possibly, algebra), plane geometry, solid geometry, astronomy, and music, or harmony. He would have had these subjects taught in such a way that the student would be led to contemplate the nature of abstract ideas rather than to search for practical applications. Furthermore, the atmosphere of the school would have been a permissive one in which the students would be free to attend the lectures or not as they chose. Care would have been exercised to ensure that the instruction did not deprive the sciences of their disciplinary and selective values. In other words, great emphasis would have been placed on maintaining the academic standards.

Into this kind of school Plato would have admitted all who made application, but his curriculum would have been the same for all without electives. Each would have started his studies with arithmetic. Almost immediately large numbers of the students would have found the subject dull and without meaning. Lacking compulsion, they would have neglected their studies and thus would soon have fallen far behind in their work. This experience alone would have been enough to convince them that school offered them nothing that interested them or suited their purposes, and they would have asked to be permitted to withdraw. Plato would have done nothing to keep them in school but would have encouraged them to go to some craftsman or other man of clay to learn a vocation by a kind of apprenticeship, or on-the-job training.

Other pupils would have kept up in their studies and followed along with the class for a while longer until they, too, reached the limits of their capacity. Then they, too, would have withdrawn of their own will. They, too, would have been permitted to go their way, but they would likely have found employment at a higher level than did those who had dropped out earlier. Still others would have continued further and found stations in life corresponding to the level at which they left school.

By strict adherence to high academic standards, the selection process would have operated at all levels of education, including the higher level at which the science of dialectic was expected to occupy the center of interest. Finally, only the very few students of the highest ability would have been left. By this time, these few would have been so well selected and so well disciplined that they would have been truly qualified to become the rulers of the state. These would have been the philosophers who, through contemplation, would have made available to all the benefits of true knowledge of the absolute good. By this knowledge, Plato believed, the ideal state could have been made a reality. Thus, in Plato's scheme, the educational system would have performed the socially useful function of finding, training, and finally installing the men of gold as the rulers, and of compelling all the others to obey them.

CHAPTER 7

THE METHOD OF REVELATION

Although much has been accepted and perpetuated of the teachings of Socrates and Plato, that part which relates to the manner in which the soul was said to bring us knowledge of the good from the realm of ideas seems foreign to us today. A more familiar method of acquiring knowledge is that which depicts the supernatural communicating directly with man through the voice of a prophet or some other medium. For the account of the beginning of this theory, the method of *revelation,* we must turn to a period in history which preceded the time of Plato and his doctrine of reminiscence by many centuries.

Primitive Appeals to the Supernatural

As a general rule, primitive man was inclined to look to a world beyond his senses for his knowledge of the good. He believed that knowledge sometimes came to him in dreams or during periods of induced stupor. In most cases he looked to his chiefs and medicine men to secure the needed knowledge and make it available to the tribe or clan. In every instance, the knowledge was thought to have its origin in a realm beyond the bounds of ordinary experience and, for that reason, to have a validity and veracity superior to that of his own everyday, common-sense judgments. That world from which this superior knowledge was said to come was generally thought of as a better place than this world. It was believed to be a place inhabited by a race of super-beings who were credited with superintelligence and supernatural powers. Sometimes it was also looked upon as a kind of happy hunting ground to which the best, most courageous, and most virtuous men would go after their mortal lives had ended, free to associate with the gods who had always lived there.

Because the inhabitants of that other world were looked upon as super-

beings with superintelligence, communication with them was sought. Knowledge which they might transmit to the inhabitants of this world was obviously thought to be superior to any which had its origin here. When the efforts to communicate were thought to have been successful, the knowledge said to have been received was highly cherished and was preserved from generation to generation as part of the cultural tradition. It was the alleged powers of chiefs and medicine men to establish communication with the inhabitants of the superworld that gave them authority over their fellow men.

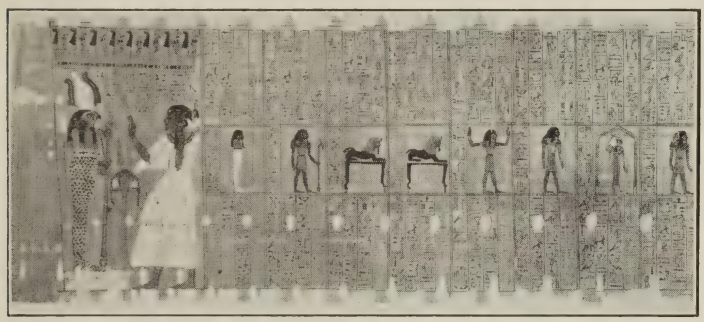

Fig. 14. A papyrus similar to the one on which was recorded the story of how the sun gods came to rule over Egypt. (*Courtesy of the Metropolitan Museum of Art.*)

Our records of the religious beliefs of the early Greeks show that they looked to Mount Olympus as the home of their tribal gods, the source of their most cherished knowledge, and the heaven to which their heroes would ascend as a reward for virtue and piety. Although the later Athenian philosophers taught other methods for acquiring knowledge of the good, the earlier belief that such knowledge has its origin in another world was never relinquished entirely by the average man in the street. The many temples and the priests who served in them continued to receive support from the people, who persisted in looking to them as the agencies for communication with the gods.

We know also that Egyptians looked to another world for their knowledge of the life good to live. In their case it was the sun to which their hopes were directed. Knowledge of the good was said to have been made available to them by the sun gods themselves, as indicated by the following account recorded on papyrus by an ancient scribe:[1]

[1] Ray S. Lineham, *The Streets of Human Habitation,* London, Chapman & Hall, Ltd., 1894, pp. 114–116.

Long, long ago, the gods reigned over men, yet they dwelt not upon the earth, but in the world that is above the earth. In process of time, however, they put on the likeness of men and descended and ruled by turns over the Lotus-Land. And when it came to the lot of Osiris, the son of Seb and Nut, he became a great King and bountiful to the people.

Later, the pharaohs ruled over the Egyptians in the manner of the sun gods and, indeed, god natures were generally attributed to them on the grounds that they were the lineal descendants of the inhabitants of the sun. These royal heirs to the Egyptian throne were believed to have been divinely appointed to carry on the affairs of the people, and they were obeyed because they and they alone were supposed to understand or to have access to knowledge originating in the sun.

Other peoples in other parts of the world also looked upon their kings as a line of men who had come from another world. The kings, too, were credited with the powers to derive knowledge from a source not accessible to ordinary mortals. Deification of the rulers was common among the peoples of Europe even in the days of the Romans; and much later the same tendency rebounded to great heights with the rise of the absolute monarchies during the declining years of the Roman Empire. More will be said about the absolute monarchies a little later.

Revelation in Hebraic Religion

It is from the Hebraic peoples that the Western world derived the now familiar concept of a heaven which is an "otherworldly" place of perfection presided over by an all-knowing, all-powerful, and all-good God. For the story of that contribution to Western culture and education, it is desirable to review briefly its origin in the history of the Jews.

The Old Testament is that portion of the Christian's Bible which was derived from Hebraic sources, and it contains the history of the origins of the universe, of man, and, in particular, of the Jews. God is pictured as the Creator, the All-Knowing and All-Powerful, who made the heavens and the earth. According to the Old Testament account, He not only created man but since then has taken a direct personal interest in the affairs of all creation, including mankind. He walked and talked with Adam and Eve in the garden of Eden. He directed the affairs of Noah and caused the tribes of Israel to emerge and to take their distinctive place among the peoples of the earth. He led Joseph and his brethren into Egypt, then appointed Moses to lead their descendants out again. He dictated to Moses the laws by which they were to be governed in the Promised Land. He sent them prophets and priests to warn them of wrongdoing and to keep them in the way of life He ordered for them.

Fig. 15. Moses descending from Mt. Sinai with the Tablets of the Laws which God had given him. (*From the Doré Bible.*)

Thus, the Old Testament is to a large extent the record of prophecy, of the word of God made known to His chosen people. The names Moses, Aaron, Isaiah, Jeremiah, Ezekiel, and Zachariah are prominent in that long list of persons who served as agents to whom God delivered special communications to help the Jews meet special situations. The God of the Jews was a personal God who understood their weaknesses and needs. He looked after them as a shepherd tends his wandering and sometimes headstrong flock—a flock pictured, incidentally, as one that never has been and probably never will be quite able to manage its affairs without calling upon the assistance of God.

To the Jews, then, knowledge of the good and knowledge of the will of God were one and the same. That knowledge was revealed to them from time to time through the voices of the prophets. The prophets were God's chosen from among the Jews, brave men who dared to withstand social pressures and to warn of transgressions. They were often looked upon as wild men from the wilderness who called upon the erring Jews to return to the ways of their Lord. As time moved on, the message of each new prophet was added to the body of revelation already in the hands of tribal priests. Thus, over the centuries was accumulated a substantial literature of prophecy and law to which the faithful and pious Jew was called upon to give respect and obedience.

Thus, by the first Christian century, the Jews as a whole believed that the only dependable knowledge of the good was that found in their sacred books. There was, of course, still a possibility that new installments might yet come through new prophets, and especially through the long-expected and long-hoped-for Messiah. With their books of revealed knowledge, the Jews felt no need for the Socratic question, for contemplation, or for philosophy in general as a method by which to bring forth the knowledge by which they should live. The words of the Lord were already on record in the form of historic examples and specific laws and commandments. The obligations of the individual to his God and his fellow men were already clearly enumerated, and his forms of worship were already spelled out in detail. To the Jew, therefore, "the most that reason and philosophy could do was to testify to the accuracy of the Old Testament revelation and to defend it by rational and metaphysical argument against rationalistic and philosophical attacks." [2]

[2] B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. I, p. 267.

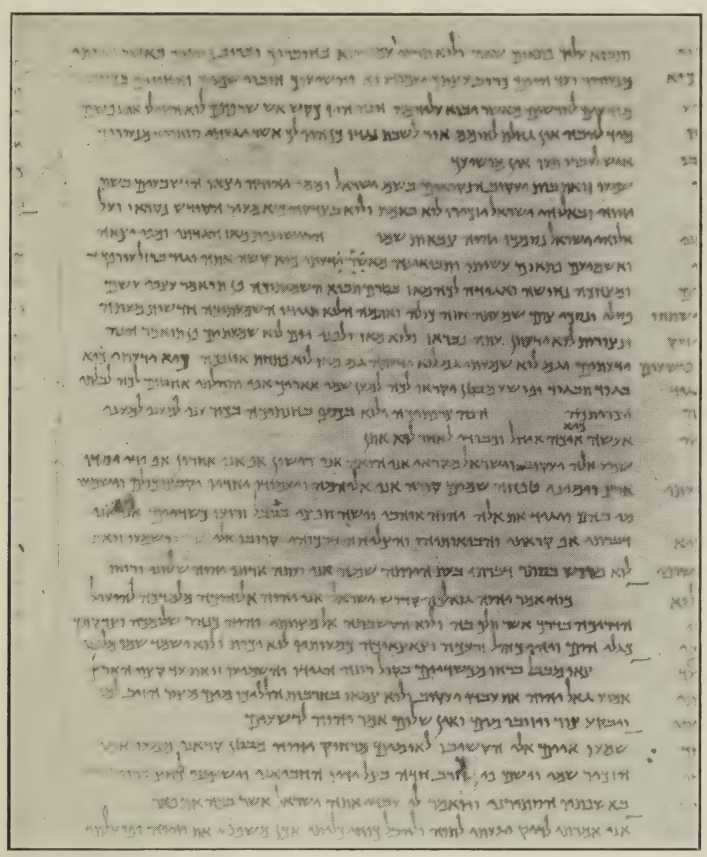

Fig. 16. A section of the Isaiah manuscript which was among the recently found Dead Sea Scrolls. This section begins in the middle of the eleventh verse of Chapter 47 and ends with the fourth verse, minus the last two words, of Chapter 49. Note the stitching on the left showing how the several sections were joined side by side to form the scrolls. (*Courtesy of the American Schools of Oriental Research.*)

Revelation in Christianity

The roots of Christianity were nurtured deep within the Jewish tradition of revelation. Jesus was a Jew, as were many if not most of the company of people who surrounded Him during his lifetime and were most responsive to His teachings. To this small handful of intimates, He appeared as a new prophet who brought them a new interpretation of the good life. Unlike the usual leaders, priests, and learned men imbued with the ways of an elite class, Jesus arose from the poor. He lived and worked among the lowly and taught that through the grace of God anyone might attain a status of dignity and worth heretofore reserved for the wellborn alone. He taught that all men are equal in the sight of God, even though that equality may not become manifest until the life to come.

The promise of a good life to come for those who listen, believe, and obey was a prophecy. Like Old Testament prophecy, it had to be accepted on faith; and faith in the prophecy of Jesus became the foundation of the Christian's way of life. That faith consists in the acceptance of Jesus as a true prophet, and even more than a prophet—the greatest and last of the prophets, the very Son of God.

It is clear to us why this new prophecy brought by Jesus to supersede the knowledge revealed by the older prophets was recorded in a separate book, which came to be known as the New Testament. Christians, accordingly, have turned to the prophecy of Jesus as their guide to the good life, a guide that is recorded primarily in the New Testament. The Jews, on the other hand, have continued to live by the prophecy of the Old Testament. It is this difference with respect to the body of revealed knowledge to which each gives his allegiance, rather than a difference in method for acquiring knowledge, which separates the orthodox Christian from the orthodox Jew today.

Propagating Christian Revelation

The early history of Christianity is the story of an idea working its way by word of mouth among the people against great opposition from those in high places. The doctrines of universal brotherhood, of immortality for all who will believe, and of a new way of life revealed in the teachings of Jesus made a tremendous appeal to the masses. Many of those who listened to the early Christian apostles were slaves who entertained no earthly prospect for an improvement in their economic and social status, either for themselves or for their children. How many of the small band mentioned by name in the New Testament as the companions of Jesus

Fig. 17. Jesus delivering the Sermon on the Mount. This Sermon is the very essence of the body of revealed knowledge on which Christianity is based. (*From the Doré Bible.*)

could read or owned real estate is not known. We have no direct account of His teachings which was set down in writing during His lifetime. The Four Gospels, which are the separate accounts of His life and work as reported by the four men whose names they bear, were at first merely verbal reports transmitted by word of mouth primarily by Jews and in Aramaic. Many years later, the four accounts were put in written form by persons who chose to write in the Greek language.

Nor was there at the beginning of the Christian movement any administrative machinery to unite the converts into a church. There was at this time no clearly defined body of doctrine, and each convert or group of converts who gathered together for mutual support and encouragement lived by what they personally understood to be the teachings of their prophet. It is to these groups scattered here and there that Paul and the other apostles journeyed to teach and preach in the manner described in the Acts. Several of the apostles, notably Paul, followed their visits with letters, and from these collected Epistles, together with the Four Gospels, most of the New Testament was formed.

Soon the established congregations began sending missionaries into surrounding communities. Quite naturally, the mother congregations exercised a protective watch over their activities. Soon an administrative relationship developed between the leaders of the mother congregation and the several missionaries who had been sent out. Sometimes these leaders in the home congregations wrote letters of encouragement, exhorting those who had gone out to remain firm in the faith. When differences of opinion on the interpretation of matters of belief appeared, as they very evidently did appear, arguments were prepared by some of these leaders in defense of their particular interpretation in the hope that the differences might thus be resolved. Some of the more vigorous and more productive of these leaders are now known as the *church fathers*. Among them we recognize the names of Augustine, Jerome, Ambrose, and Bonaventura, and many of them have since been canonized.

What is significant here is the fact that the present rather substantial body of Christian doctrine has been acquired (1) from the recorded accounts of the teachings of Jesus, (2) from the Epistles of the apostles, and (3) from the writings of the church fathers. Such doctrine is regarded as the revealed word of God and is held to be true by the believer for the same reason that the Jews regarded the Old Testament prophecies to be true. Although Christian doctrine has been revealed through the agency of many individuals and over a period of many years, divine inspiration, it is said, has guaranteed the validity of the resulting body of doctrine. That is, its validity is guaranteed by its source. Its author is God in heaven, the All-Good, All-Powerful, All-Knowing. The body of doctrine so revealed is not to be

questioned by mere mortals or subjected to examination in the light of data derived from the realm of sensory experience. On this point the church fathers have been quite clear. Tertullian, commenting on the doubts voiced by some skeptics concerning God's sacrifice of Himself on the cross, wrote, "It is believable, because it is absurd; it is certain because it is im-

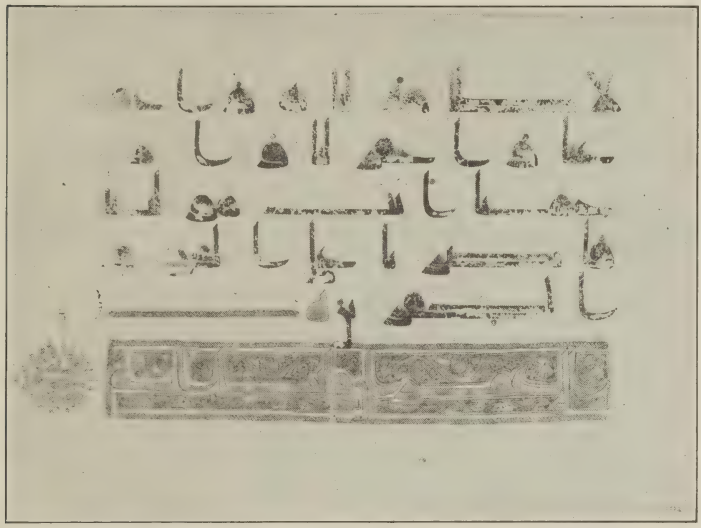

Fig. 18. Leaf from an ancient Koran, the book which records the revelations delivered to Mohammed. (*Courtesy of the Metropolitan Museum of Art.*)

possible." The English monk William of Ockham voiced substantially the same sentiments in almost identical words many years later.

Just as the Jews today cherish and live by the knowledge revealed through the Old Testament prophets, and the Christians by the new revelation brought by Jesus, so also do the Moslems have their revealed wisdom, as dictated by Allah to Mohammed, and the Mormons their book of wisdom, delivered to Joseph Smith. Each of these bodies of knowledge is said by its adherents to have had a supernatural origin. In fact, the basis of any religion is the particular attitude taken by those who believe in it with regard to the supernatural and the role it plays in the affairs of men. Religion implies a particular attitude assumed as a deliberate act of faith with reference to the supernatural.

Like the four great religions mentioned above, the traditional religious attitudes familiar to us today are based on the belief that knowledge of the good is revealed to men by the supernatural being in which they place their trust. The differences between the several religious movements clearly stem from the fact that each group claims a different body of knowledge as the only body that has truly been revealed. In the final analysis, each looks to a God as the author of its revelation who is surprisingly similar to the God in whom each of the others believe. Each religious group has produced a priesthood, which is charged with responsibility for keeping and propagating its version of the revealed word.

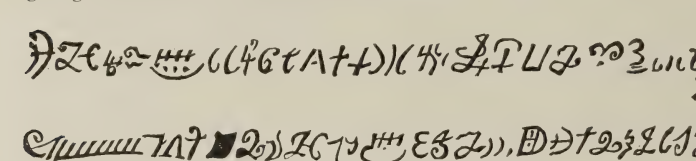

Fig. 19. Facsimile of characters of the Book of Mormon as this revelation came into the hands of Joseph Smith on golden plates.

The particular tradition of revelation which has enjoyed a near monopoly in the development of Western civilization is, of course, the Christian tradition. We must look within it, therefore, to trace the nature of the influence which belief in the theory that knowledge of the good is revealed has had in shaping the social and educational institutions of Europe and America.

Interpreting Christian Revelation

Many Christian sects today teach that Jesus revealed all the knowledge God intends man to have, or all the knowledge that man needs for the proper conduct of his life here below. To these Christians, revelation was finished for all time when the last words were spoken by Jesus on the cross—or, at least, when the last book of the New Testament was finished. These hold that the New Testament is the only book of knowledge, the only authority, and the only guide to the good life. All that men have added by way of comment and interpretation is held to be merely *the opinions of men* and is not to be taken as absolute truth. Further reference will be made to this point of view at the end of this chapter.

Early Christians seem to have continued the pre-Christian tendency to expect partial, and to some degree private, revelations to come to individuals living in their midst. Theirs was an age of miracles, when it was believed that God takes a direct and immediate interest in the affairs of men.

The miracles were reported instances in which the ordinary course of events, and even the natural laws of cause and effect, were interrupted and di-

Fig. 20. Henry II, a Saxon king of the tenth century represented as receiving from God the Crown, Holy Lance, and Imperial Sword. From Henry's Missal. Figures 20 through 23 show how supremacy of the civil authority over ecclesiastical authority was reversed.

verted by supernatural intervention to serve supernatural purposes. It was also an age when men in positions of authority, such as kings and judges, were looked upon as the special representatives of God on earth. Because

of their appointment, they were thought to draw directly upon the wisdom of God in rendering judgments or in making and enforcing laws.

Some of the early Christians, however, came to question what appeared to them to be conflicts between the decrees of the governmental officials and the teachings of Jesus. They raised the questions of what were the Christians' obligations to the existing governments and whether they should obey laws and commands if such were judged to be contrary to the teaching of Jesus. To this, Paul wrote in one of his letters to the congregation of Christians in Rome as follows:[3]

> Let every soul be subject unto the higher powers. For there is no power but of God: the powers that be are ordained of God. Whosoever therefore resisteth the power, resisteth the ordinance of God: and they that resist shall receive to themselves damnation. For rulers are not a terror to good works, but to the evil. . . . For he is the minister of God to thee for good. But if thou do that which is evil, be afraid; for he beareth not the sword in vain: for he is the minister of God, a revenger to *execute* wrath upon him that doeth evil. Wherefore *ye* must needs be subject, not only for wrath, but also for conscience sake. For for this cause pay ye tribute also: for they are God's ministers, attending continually upon this very thing.

The King as God's Agent

We noted earlier that some of the Romans, as well as other people of their day, looked upon their rulers as gods or near gods. Some maintain that the deification of the rulers was for the Romans of the early Christian century little more than the act of attributing to them the good qualities they *ought* to have. It seems quite clear to others, however, that it was widely believed that the king "possessed a divinity which the common man did not share and which brought to disaster the unworthy usurper who claimed the high office without the blessing of Heaven."[4] If the latter opinion is substantially correct—and the teachings of Paul seem to have encouraged that belief even among the Christians—then the king and his appointed representatives must have been looked upon quite generally as the instruments through whom God would speak whenever He had a message to give to His people here below.

History provides ample evidence of the existence of a substantial and powerful group in the Roman Empire who held that the civil ruler is the supreme authority in the affairs of men. Those who supported this view became known as *monarchists*. They were especially powerful during the

[3] Romans 13:1–6.

[4] George H. Sabine, *A History of Political Theory,* rev. ed., New York, Henry Holt and Company, Inc., 1950, p. 148.

early centuries of the Christian era. Their number included many members of the Christian clergy as well as those of more secular callings. To all of them, it was the sword of civil government through which the will of God was said to be made to prevail, and it was the civil power therefore which they said should exercise dominion over all matters, even over the ecclesiastical powers.

Fig. 21. Investiture of a bishop by a king. From a Codex in St. Omer.

Though the view of the monarchists was eclipsed for a period of time during the decline of the empire, we shall see that it enjoyed a return to popular acceptance centuries later with the rise of the absolute monarchies which ushered in the modern European states. The absolute monarchs were welcomed at that time because their exercise of total power, supposedly guided by the hand of God, was expected to provide peace and stability in the wake of the religious wars that had swept over Europe at the time of the Reformation. Thus, James I of England—the monarch who witnessed the exodus of the Pilgrims to America—was quoted as saying: "That which concerns the mystery of the king's power is not lawful to be disputed; for that is to wade into the weakness of princes, and to take away the mystical reverence that belongs unto them that sit in the throne of God." [5]

Here, then, was the basis for the absolute monarch's claim upon the

[5] *Ibid.*, p. 396.

loyalties and obedience of his subjects. The king's power was of divine origin, and he ruled by divine inspiration. The prince who occupied the throne had been put into the line of succession by divine will, and this prince of heaven as well as of earth was by his very nature incapable of doing any wrong. The church, therefore, quite properly should be an agency to aid him in carrying out the will of God. It must be made, in effect, the moral arm of the state with the king at the head of the priest class just as he was the head of the civil administration.

As for education, only those destined to exercise power either in the state or in the church were thought to require formal training for their duties. The good life, it was believed, would be made known to the rulers by divine inspiration, and the lesser people would be informed of it by royal decree publicized by the agents of church and state. What need had the lesser folk, therefore, for training in the pursuit of knowledge of the good?

The Pope as God's Agent

History does not provide a picture of an easy and uniform submission on the part of all Christians to the authority of kings and emperors. It will be recalled that the question of obedience to the civil authorities was one of the points on which the Pharisees believed they could trap Jesus into taking a subversive position.

"But he perceived their craftiness, and said unto them, Why tempt ye me? Shew me a penny. Whose image and superscription hath it? They answered and said, Caesar's. And he said unto them, Render therefore unto Caesar the things which be Caesar's, and unto God the things which be God's." [6] But what specifically, asked some of the early Christians, are the things which belong to God and those which belong to Caesar?

At first the divided loyalty implied by the words of Jesus did not seem to be unduly troublesome. As was noted earlier, there was at the beginning of Christianity no formal church organization and no official body of doctrine by which to judge orthodoxy. Individual Christians were largely on their own. When a church organization did emerge and a statement of essential beliefs was proclaimed, some of these beliefs tended to deny the supremacy of the civil powers. As a consequence, conflicts developed over the question of supremacy, especially as the empire became weaker and the church stronger.

For a time a balance of power was achieved through "the doctrine of the two swords." This doctrine was based on the theory that man has a dual nature—one a physical and temporal nature, the other a spiritual and immortal nature. The doctrine recognized the emperor's authority to speak on

[6] Luke 20:23–25.

temporal matters and to command the services of the *bodies* of his subjects. To the church, however, authority was given to speak on spiritual matters and to command the loyalties of men's *souls*. Thus Ambrose, writing in the latter half of the fourth century, strongly asserted the autonomy and supremacy of the church in spiritual matters, even to the extent that in *matters of faith* "bishops are wont to judge of Christian emperors, not emperors of bishops." The line of demarcation between the two authorities was so clearly drawn, in his opinion, that he admitted the authority of the emperor over *secular property,* including the lands of the church, and reserved to the church only the church buildings which are dedicated to a spiritual use.[7]

The doctrine of the two swords, a forerunner of the modern principle of separation of church and state, was asserted again in the fifth century by Pope Gelasius I. By that time the church was firm in its claim that Jesus had decreed the separation of the two powers; and it asserted, therefore, that no man might exercise both temporal and spiritual powers and remain a good Christian.[8]

It is not within the province of this study to trace the steps by which the authority of bishops within the several dioceses was established, or how the bishop of Rome came to exercise dominion over the other bishops. Nor can we take time to recite the story of how, with the decline of power of Rome over the several parts of the empire, the spiritual sword gained dominion over the civil. It is clear, however, that by the thirteenth century the doctrine of two swords was being discarded. John of Salisbury laid claim in the name of the church to the temporal as well as the spiritual powers, and Pope Innocent IV wrote: [9]

> Jesus Christ himself made Peter and Peter's successors his vicars when he gave them the keys to the heavenly kingdom and said "Feed my sheep." Though there are many offices and governments in the world, there can always be an appeal to the pope when necessary, whether the need arises from the law, because the judge is uncertain what decision he ought legally to give, or from fact, because inferior judges cannot execute their judgments, or are not willing to do justice as they ought.

A few years later, Boniface VIII restated the papal claim to both swords in the famous bull *Unam Sanctam*. He made it clear that the temporal sword was not to be employed by the clergy but that the civil authorities might use it "at the command and with the permission of the priest." He also asserted the claim that the Pope was supreme in the church and that personal subjection to the Pope was a necessary condition to salvation.

[7] Sabine, *op. cit.*, p. 188.
[8] *Ibid.*, p. 195.
[9] *Ibid.*, p. 272.

It was by these and similar actions over a period of centuries that the claims of the Roman Catholic Church to be the true and the only agency

Fig. 22. Henry V, a German king of the twelfth century, portrayed as receiving the insignia of his office from Pope Paschal. From the Ekkehard Manuscript.

for receiving knowledge of the good were established in practice, and the ground was prepared thereby for the doctrine of infallibility, which was finally declared as dogma in 1870. A more complete description of the role education came to play in the service of the church will be given in the next chapter.

Fig. 23. Monks humbling Henry II of England on order of the Pope, for the death of the Priest Thomas Becket. From an old print.

Protestants Reject Papal Authority

In time, the papal claims of supremacy and infallibility reviewed above came to be bitterly disputed within the Roman Catholic Church itself. This is plainly evident to anyone who reads the history of medieval and modern Europe. For example, Philip the Fair, king of France and a Catholic, refused to concede the supremacy of Boniface VIII and humiliated the Pope so severely that he died of chagrin. For a time thereafter, there were two popes, and at one point three, each of whom claimed to be the only true vicar of Christ on earth. At another time, a conciliar movement was launched by powerful segments within the ranks of the clergy not only to curb papal powers but also to deprive the pontiff of much of his revenues.[10] These moves

[10] Preserved Smith, *The Age of the Reformation,* New York, Henry Holt and Company, Inc., 1920, p. 15.

to correct abuses, verified by Catholic scholars, especially in the account of the Reformation which appears in the *Catholic Encyclopedia,* lend support to the statement that for a time the papacy was treated as a political prize and that successive incumbents, notably Sixtus IV, Innocent VIII, and Alexander VI gave little evidence, indeed, of having sensed any high spiritual calling.

The point in referring here to the unhappy days that befell the Roman Catholic Church is to show that events and the deeds of men in high places did not always measure up to the role the church expected them to play. As a consequence, the authority of the church itself came under criticism. As we shall see later, some disillusioned people began to turn to methods other than revelation for securing knowledge of the good. Some of these efforts were associated with the Renaissance. But even when the Renaissance was already well under way, a substantial number of the intellectuals continued to cling to the church as the agency for receiving and teaching knowledge of the good. When a substantial number of the individuals charged with carrying out that lofty role were suspected of being unworthy of their high calling, a number of reform movements were launched *within the church.* Some of these appeared as much as two hundred years before Luther's time. The reform movements were usually led by some devout priest or monk. Members of the Dominican and Franciscan orders, called *mendicants* because of their custom of traveling among the common people and living by alms, supplied a remarkable number of these reformers. Few attained even temporary success, for they and their followers were usually excommunicated and were sometimes burned as heretics. Also, a few movements appeared which developed into splinter groups, such as the Albigenses, the Waldenses, and the Hussites. Sometimes these groups were led by clergy with strong intellectual interests, and sometimes by laymen. Sometimes they gained temporary success in isolated areas.

About the middle of the fourteenth century, the Franciscan monk William of Ockham called for reform by urging a return to the Scriptures as the final and only source of knowledge of God's will for men. This call to substitute "the Book" for the church as the authority which can supply us with knowledge of the good life is the mark of the real Protestant movement. For a time, scholars such as Wycliffe, Erasmus, and Colet were content to stay within the church but were inclined to direct a critical eye to the official interpretations of the Scriptures and to the large body of doctrine that had come to be accepted in the church. These scholars were the product of the reawakened interest in the ancient Latin and Greek which accompanied the Renaissance, and they became critical of the translations of Scripture, especially the Vulgate, the translation that was prepared under the direction of Jerome in the fourth century. They came to believe that much

Fig. 24. Burning of John Huss, a reform leader before the time of Luther.

of the Vulgate was in error. Valla, a member of the papal staff, joined in this critical study. He also turned his attention to the Donation of Constantine, a document on which many of the papal claims to supremacy over the civil authorities were based, and he is alleged to have proved it to be a

Fig. 25. Early Protestants portrayed departing from the leadership of Roman Catholic authority to follow the authority of the Bible.

forgery. The effect of these developments was to send men to the original Greek and Hebrew forms of the Scriptures to find what of church teachings had been truly revealed and what had been admitted in error.

Thus, the intellectual and emotional ground was already well prepared for reform when Martin Luther precipitated a more substantial break with the authority of the church in 1515. Luther, an Augustinian monk, became convinced while lecturing on Paul's Epistle to the Romans that salvation

is a gift from God to man and is gained by faith alone. Thereupon he repudiated "the medieval ecclesiastical system of salvation by sacrament and the good works of the cloister." [11] He denied the authority of the church to dispense the gift of salvation or to mediate in the forgiveness of sin. Thus, when the unscrupulous Tetzel, an agent employed by Archbishop Albert of Magdeburg to collect funds for Rome, went about selling indulgences and promising that "as soon as the money clinks in the chest the soul of some dead relative flies from purgatory," Luther acted on his convictions. He nailed his famous ninety-five theses challenging the authority of the church in these matters to the door of the Castle Church in Wittenberg and by that act invited his brother priests to air the matter in a theological debate.

The developments that followed from Luther's challenge to the Roman Church established the Protestant Reformation as a great religious movement. The Protestants came to regard the Bible literally as the book which contains the revealed will of God. As a book, it was a finished thing. Revelation stopped when the final "Amen" was written to Revelation, the last book of the New Testament. Within the pages of that book, men were said to have all the answers God has seen fit to give them. Anyone may read them and comment upon them, but nobody can speak for God when he attempts to interpret them to others. Thus, the Scriptures must be made available to all men so they may learn the will of God for themselves. When they have read, they will be able to order their affairs so that the will of God will "be done on earth as it is in Heaven."

At the outset, Luther called for men to revolt against the authority of the Catholic clergy and to draw their leadership directly from the Scriptures. When this spirit of revolt led to civil disobedience as well, he set up the Lutheran Church to stand beside the civil government and exert a directing influence among the people in spiritual and moral matters. Thus, though the Scriptures continued to be the authority, the church now stood as the agency for interpreting them in the everyday affairs of men.

Once again, then, it was held that knowledge of the good was available not fully and directly to the individual but indirectly and through the agency of the church.[12] Furthermore, Luther asserted the right of the civil powers to reform the spiritual powers and urged the governments to exercise this right. This was a clear resurgence of the doctrine of the supremacy of the civil sword over the spiritual sword.[13] Needless to say, it helped prepare the way for the absolute monarchies, a number of which came to be sup-

[11] *Ibid.*, p. 65.

[12] Crane Brinton, *Ideas and Men,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1950, p. 311.

[13] Smith, *op. cit.*, p. 70.

ported by the Lutheran or some other national church during the years that followed.

Individual Conscience as God's Agent

The Protestant call to revolt against authority released forces which later were not to yield so easily to new masters. Luther himself declared at the outset that the Scriptures were the Christian's only authority and that each Christian was his own priest. Like other Protestant leaders, he appealed to the writings of Augustine, who had taught that each soul is unique and that each is capable of learning to know the truth with which God "had endowed or is continually more fully endowing her."[14] Augustine clearly had believed not only that revelation is continuous and progressive but also that it is made available directly to the individual. To many Protestants it came to appear, therefore, that no institution, whether ecclesiastical or civil, should be permitted to stand between the individual and his God. The individual who was "right" with God was believed to walk by knowledge "made manifest to us by the inner light vouchsafed us by God, and impressed upon us *a priori* quite independently of sensible experience."

The view that the Christian walks by a special inner light came in more recent times to find expression in the demand for freedom of conscience. The dictates of conscience came to be regarded as sufficient authority to justify opposition to any and all laws, decrees, and dogmas not in harmony with the individual's personal communications from God. The urge to rebel, when that urge was encountered, was held to have been received from God—a view that made untenable the authoritarian claims of institutions, whatever may have been the basis of their claims. For these later Protestants, education was made to deal with the problem of establishing proper relations with God, a matter that called for much Bible reading and, therefore, for at least some schooling for all.

To summarize briefly, we have seen the several ways by which men have held that knowledge of good is revealed. We have also seen that each system of belief has portrayed the mind or soul as a sort of inert "channel through which a universal and divine intelligence operated." That channel had no warrant to alter in any way the communications transmitted through it. The individual who inferred meanings not clearly implicit did so at his own risk "and only to the detriment of the truth." Ideas, the elements of knowledge, were not thought to originate in the minds of men. They could not be thought into existence but were believed to exist prior to, and independent of, human knowledge of them. Thus they could only be *received*. Education,

[14] Fuller, *op. cit.*, pp. 340–341.

therefore, came to be charged with the socially important role of fostering the receiving process and of preserving and propagating knowledge that had already been revealed. We are now ready to take a look at the ways in which education came to be used by various groups that lived by knowledge said to have been revealed.

CHAPTER 8

LEARNING TO USE REVEALED KNOWLEDGE

We have seen how primitive man believed that he and his kind lived in a special way that set them off from and above all other people of their day. He was convinced that his superior way of life had resulted from special knowledge made known to his people and to no others. The miraculous manner in which that knowledge was believed to have been revealed provided the basis for his tribal legends and religious activities.

It was also indicated in the preceding chapter that among those groups that believed knowledge of the good is revealed considerable variation came to exist about the precise manner in which knowledge was said to have been made known to them. In some groups it was said that on a certain day in the dim history of the people the skies opened and delivered to them a young man or woman fair as the gods. This person remained among them for many days, during which he led them as their ruler and imparted to them the knowledge that has guided them ever since. In other instances, a voice was heard intoning to some one of them the words of wisdom that have led them in the right path to this day. Still other methods are described in the literature of anthropology. Each method was to some degree unique, and each provided for those who believed in it the assurance that they and they alone were selected to receive the special gift of true knowledge.

No matter how much the several methods differ in detail, they nevertheless have in common a firm conviction that the knowledge received has a supernatural origin. Since it comes from a realm outside of and superior to the world of everyday experience, the validity of this knowledge cannot be tested in the world of everyday experience. Nor can the young be expected to duplicate or even to reproduce that knowledge if left to their own resources. Should a single generation be allowed to grow up without making that

knowledge the basis of its way of life, the entire heritage would be in danger of being lost for all time. This fact places a special responsibility upon each generation of adults to teach the children the ways of their fathers and to secure their allegiance to that way. The necessity of transmitting the way of life, it will be recalled from an earlier chapter, is the prime motivation for all education.

Rise of a Priest Class

It is probable that from the earliest times children have acquired much of their knowledge and most of their beliefs directly from their elders. Children everywhere learn to fear what their parents fear and to place their faith in

Fig. 26. Samuel anointing David to succeed Saul as King of the Israelites. Note the preparations for the ceremony which is to follow and which will impress upon the people that David will rule by authority given him by God. From a painting by Claude Loraine.

the things that give their elders assurance. However, history indicates that as the body of beliefs and legends of a given group became substantial the educational resources of the family became inadequate for the task at hand.

This fact became especially apparent when many families and clans came to be bound together by a common heritage into tribes and nations. To preserve the uniformity of beliefs, loyalties, and practices, a special priest class was brought into existence to supplement and to take over some of the work formerly done by the family. It became the particular duty of the priest class to preserve the social heritage and to teach and interpret it to the people.

Teaching the Masses

Because the priest class made its appearance before writing, as we know it, was invented, the teaching responsibilities could not be met through the preparation and distribution of books or other forms of reading materials. Oral methods were employed, and apparently to good effect. When we think of the religious festivals and the holy days as devices used by the priests to teach the tribal lore, their importance as educational agencies soon becomes apparent. Such festivals were usually held in commemoration of some event of significance in the history of the people. The activities associated with them were designed to portray the event in its important details. Furthermore, the activities were conducted in an atmosphere of reverence and piety admirably suited to inculcate deep religious emotions and to unite the people in a common spirituality.

In the more primitive societies, the priests played numerous important roles in the social affairs of the people. They called the people together at regular intervals not only to remind them of their religious obligations but also to exhort them to do their duty to their gods and their fellow men. Their interpretations of the religious heritage in everyday life came to take on the aspect of preaching. That is to say, the revealed knowledge was imparted by the priests to the people who had been brought together for just this purpose; and to these assemblies and to the places of assembly men attached such names as synagogues, mosques, parishes, and congregations. Preaching to these assemblies and leading them in the performance of religious rites were very important forms of *oral* teaching.

In more highly developed groups, the festivals and holidays were not limited to preaching or the dramatization of historic events. This became the case especially when the story of the events could be transmitted by means of the written word. But for large numbers of people, even in the more advanced groups, oral methods were still necessary and sometimes took the form of interpretive plays and dramas. The role played by the early Greek theater is an illustration in point. The plays taught and interpreted aspects of Greek belief and thought. In the absence of newspapers, books, magazines, and other media of mass communication, they helped

Fig. 27. Preaching the Koran in a Mosque. To people who cannot read, this form of oral teaching is very important.

develop a feeling of national pride and were important centers of the intellectual and social life of the people of their day.

The Beginning of Formal Education

Priests in general had the special responsibility of preserving the knowledge revealed to the tribe or nation. As primitive tribal lore accumulated, the responsibility of preserving the social heritage came in time to tax the priests' powers of memory. Because of the importance attached to the body of knowledge for which they were responsible, the possible loss of any part thereof became a matter of grave concern. To guard against such misfortune, ingenious priests were stimulated to design various aids to memory. Some of the picture writing found in caves believed to have been inhabited by primitive peoples may have served this purpose. Some priests used twigs which they twisted together to form different symbols, as in the evolution of writing among the Germanic peoples. The hieroglyphics and the cuneiform systems of symbols represent relatively advanced stages in the evolution of the art of writing.

Whatever the system of symbols which came to be employed, the reduction of the social heritage, or any significant part thereof, to graphic form called for a change in the method of educating candidates for the priesthood. Before the introduction of writing, the education of the priest class depended upon direct methods. The apprentice priest, selected by whatever method prevailed among his people, acquired his specialized knowledge orally and through observation and participation with the older priest in the performance of the priestly duties. Later, after the tribal lore had been recorded by means of a system of symbols, it became necessary for the candidates to the priesthood to learn to read the meaning of those symbols. This could not be done by direct participation and observation alone. Special instruction was required, and to provide for it the priests developed a type of reading class or school. These classes are what historians of education generally refer to as the first formal schools.

It should be observed that the schools, or classes of instruction, were designed to serve the requirements of a very small fraction of the total population. The content of instruction—that is, the *curriculum*—consisted of the tribal traditions and cultural heritage. Those who received the benefits of education were also required to assume the special responsibility of preserving the heritage and of teaching it to the people. Thus, formal education which included an introduction to the mysteries of reading—an accomplishment sometimes represented as a special gift from the gods—was reserved for the priests. On the other hand, the oral methods which were

Early Egyptian pictorial symbol for "sun."

Classical Assyrian cuneiform symbol for "sun."

(*a*)

1800–01 The winter 30 Dakotas were killed by Crow Indians.

1801–02 The winter of the smallpox epidemic.

1802–03 The winter horses with shoes were seen for the first time.

(*b*)

Fig. 28. Examples of prealphabetic writing. (*a*) Early Egyptian pictorial writing was done by painting on papyrus with a brush. Cuneiform systems employed a wedge-shaped stylus to make impressions in wet clay. (*After David Diringer, The Alphabet, New York, Philosophical Library,* 1948, *p.* 46.) (*b*) Samples of pictorial writing developed by the North American Indians. These three symbols, used by the Dakotas, are called "winter counts" and represent the years indicated. (*After I. J. Gelb, A Study of Writing, London, Routledge and Kegan Paul, Ltd.,* 1952, *p.* 43.)

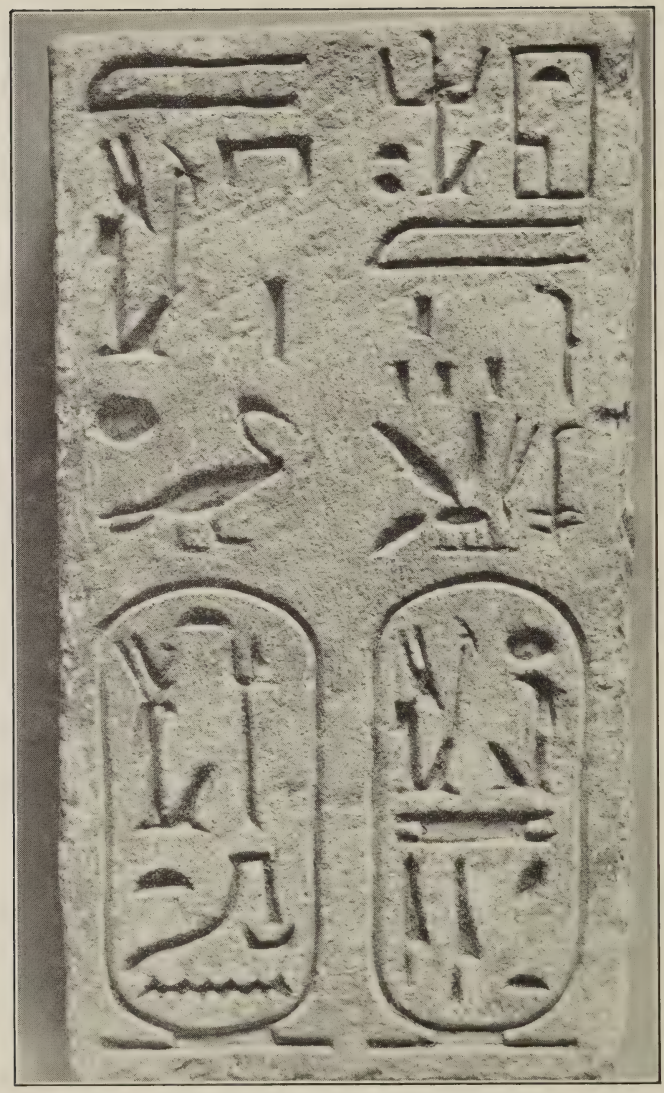

Fig. 29. Sample of early writing inscribed on a brick during the XIX Egyptian Dynasty. (*Courtesy of the Metropolitan Museum of Art.*)

Fig. 30. Exercise tablet from the temple school at Sippar. The young scholar apparently was required to write the words "God Urash" three times. (*Courtesy of the Metropolitan Museum of Art.*)

noted earlier and which are still employed in the synagogue, the mosque, the parish, and the congregation were used to teach the people.

Education among the Jews

The educational arrangements employed by the Jews before the rise of Christianity afford us a very good example of the social role and significance of the priest class. The Jews lived among the Greeks, Romans, and Arabs but were not culturally integrated with them. For the most part, the Greeks and Romans had thrown off the domination of their priests and had resorted in a limited way to a form of secular intellectualism, at least in matters political. The characteristic that set the Jews off from their Greek and Roman neighbors was their adherence to the Hebraic religious tradition which had been revealed to them through a long line of prophets.

This rather large body of revelations was preserved for the Jews by their priests, now called *rabbis,* which means "masters," a title of respect given to teachers. The rabbis were scholarly men trained to read their sacred books and to interpret the knowledge recorded therein. The rabbis called the

laymen to the temples and synagogues at stated intervals to renew their faith in the special leadership of God and to give instruction in the way

Fig. 31. The Japanese storyteller. This was another example of oral teaching employed by societies with large numbers of illiterate people.

of life God required them to live. The Jews maintained rabbinical schools for the education of their priests but depended upon oral methods of instruction in the synagogues to preserve their religious tradition among the people.

Beginnings of Christian Education

Christianity as a separate religious movement began when Jesus was born in a remote Jewish community far to the east of the capital of the Roman Empire. Jesus' life and upbringing were that of a Jew. His acquaintances were Jews. In time, he began to preach to them about a new way of life which would supersede the old prophecies they had cherished for so long. The rabbis, charged with responsibility for preserving the traditional prophecies, looked upon this young layman as an impostor preaching heresy.

The appearance of Jesus among the Jews obviously presented a critical problem. Those who believed and accepted His prophecy found themselves in conflict with those who insisted upon preserving the Hebraic religious tradition. As it developed, the Christians, as the followers of Jesus came to be called, were those who splintered off from the main body of Jews, although they preserved many of the Jewish customs and ways of worship. As a matter of fact, some of the first congregations of Christians met in the synagogues where they had previously met as congregations of Jews.

The early Christian leaders came in time to assume some of the duties of the rabbis. They preached to the congregations and led them in the observance of the Christian festivals and rituals. Also, the pattern of the rabbinical school was there for them to follow, even though at first they found little use for such special education. They neglected to develop an educational program immediately for several reasons but primarily because they expected Jesus to return in person to set up His kingdom on earth even within their own lifetime.

Catechumenal Classes

As time went on, the Christian leaders became aware of a need for some form of systematic instruction in religious doctrine. This realization was brought about because Jesus did not return immediately as expected. Thus, it became necessary to preserve the new doctrine and to transmit it to the young if it was not to be lost upon the death of those who had received it directly from Jesus. Furthermore, a number of individuals not prepared to withstand the trials and tribulations of the early Christians at the hands of their persecutors had gained admission to their company. To minimize the danger of admitting spies and potential informers, applicants for membership were required to undergo a period of testing. During the waiting period older Christians gave them special instruction in matters of faith and watched them carefully to determine whether or not they possessed the necessary steadfastness and conviction to make them worthy additions to the cause.

During the period of waiting and testing, the applicants were known as *catechumens*. The special arrangement by which instruction was given by older Christians became known as the *catechumenal class*. Very frequently the classes consisted of adults, but as the children of Christians applied for membership, they, too, were entered in the catechumenal classes. For many years, instruction continued to be given almost exclusively in oral form, and the catechumenal classes must not be regarded as schools in which instruction in reading or writing was given.

Catechetical Classes

As the Christian congregations became better established, they undertook evangelistic enterprises. Members traveling individually or in groups were sent into neighboring communities to preach the gospel and to win new converts. Their missionary efforts invited criticism and frequently involved the preachers of the new gospel in controversy. As a result of such experiences, it became apparent that the missionaries required something special in the way of training. To this end, the older and more experienced Christians prepared lists of the questions most frequently raised by the nonbelievers and provided well-thought-out answers for each question. These questions and their answers, along with other useful information, were taught to the younger missionaries before they went out on their assignments. The method of teaching by means of questions and answers is still known today as the *catechetical method*. The classes of instruction organized by early Christian congregations for the benefit of the missionaries became known as the *catechetical classes*. Instruction in catechetical classes was also given orally, though it appears that many who came to attend them were able to read.

By the second Christian century, many learned scholars were being converted to Christianity. They and their followers longed for something more in the way of doctrine than the simple creed of faith taught by the apostles. Such a group met regularly at Alexandria, the capital of learning in that period. This group examined Christian doctrine from an intellectual viewpoint and endeavored to trace its implications for secular matters. Under the distinguished leadership of established philosophers, such as Pantaenus, Clement, and, later, Origen, this group came to be known as the Catechetical School of Alexandria and exerted a strong influence in forming the growing body of Christian doctrine.[1] Other catechetical schools appeared to serve the needs of similar groups, most of whose members had received earlier training in pagan schools.

The early catechetical schools apparently were not inhospitable to pagan

[1] Frederick Eby and Charles Flinn Arrowood, *The History and Philosophy of Education, Ancient and Medieval,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1940, p. 610.

learning and, indeed, frequently sought to employ philosophy and science in the service of Christianity. However, the fervor of the fourth- and fifth-century Christians did not allow for such easy communication with the culture and literature of non-Christians, and the more scholarly catechetical schools seem to have disappeared from the European scene with the advent of the Dark Ages. Thereafter, the preparation of new leaders for the church reverted once more to the simple catechetical class with its oral methods and greatly restricted content.

Fig. 32. The school of Pythagoras in Crotona. This is an example of the higher schools which flourished in many cities of the Roman Empire before pagan books and scholarship were banned by the Christian emperors.

Cathedral Schools

As a result of the decline of the power of Rome and the ultimate banning of all pagan works from the libraries of the clergy and the schools, the culture of Athens and Rome quickly faded from the European scene. Even the secular schools which had struggled on for a while were apparently left very little in the way of intellectual content or popular appeal. In the fourth century, Emperor Constantine embraced the new religion and ordered that it be made the religion of all the realm. Thus, the congregations of Christians, which had formerly been treated as subversive groups, now began to enjoy social approval and legal standing. They were now permitted to receive legacies and to own property. Armed with these privileges, the church rapidly emerged as the dominant social institution and became organized along administrative lines borrowed from the earlier empire. Administrative

Fig. 33. Charlemagne presiding over his palace school.

headquarters were established in the capital cities. From these central offices, the activities of the congregations, or *parishes,* within the provinces were administered and coordinated. The administrative head of the church organization within a given province became known as the *bishop.* Among other duties, his office was responsible for supplying leadership to each of the parishes under his jurisdiction.

It was noted earlier that the Christians had set up catechetical classes to prepare missionaries and preachers for their work. Traditionally, this training did not include instruction in reading since the simple creed of the early Christians could be transmitted very adequately by word of mouth. Furthermore, there were secular and pagan schools available at that time to provide such instruction for those who wanted it. But as the secular schools disappeared, there were increasing numbers of Christian priests, and sometimes even bishops, who could not read. Indeed, when Charlemagne took over the reins of the empire at the beginning of the ninth century, neither he nor his nobles nor even the vast majority of the clergy of whom he had knowledge were what would today be called functionally literate.

It is a singular fact, and an important one educationally, that the nearly illiterate Charlemagne called upon the bishops to assume responsibility for providing a literate clergy. Furthermore, he set them an example by summoning Alcuin from the cathedral school at York to conduct a school in his palace for his family and close associates. Later, Alcuin was given the most important ecclesiastical office in France, from which it was judged his influence in the interests of improving instruction could become most effective.

Under the leadership of Alcuin, instruction in the catechetical classes was extended and improved primarily to provide better-trained parish priests. The educational activities of each diocese also tended to be concentrated more and more under the watchful eyes of the bishop. Frequently, a number of the scholars lived in the bishop's household, a practice which earned these centers of teaching the name *bishops' schools.* As the administrative staffs in the diocesan headquarters increased in size and the educational functions grew in proportion, supervision over instructional matters was assigned to a priest who was attached to the bishop's staff. This priest was given the title *chancellor.* As the educational functions of the diocese became the responsibility of members of the cathedral staff, or *canons,* as they were called, the schools became known as *cathedral schools.*

The Trivium

It will be helpful to note at this point that by the time of Charlemagne Christian literature, including the Scriptures and the works of the church

fathers, was recorded by the church in the Latin tongue. The language of instruction, therefore, was Latin, even though the individuals who applied for admission to the cathedral schools no longer spoke or understood that medium. The first requirement of the student was to learn the language of church literature, which was to him a foreign language. His approach was that of a mature person and not that of a small child. Hence, the instruction was given a grammatical orientation with much attention to the rules and special vocabulary of religious office. This part of the curriculum was designated as the *grammar* studies.

After the rudiments of Latin had been mastered, the student was introduced to various pieces of literature which met the tests of orthodoxy and were thought to contribute in one way or another to the understanding of church doctrine. Usually these works included some of the writings of the church fathers and at least parts of the Vulgate itself. In some instances, it appears, greatly abbreviated versions of the pagan Greek and Roman works in the arts and sciences were also read. These versions, of course, were first rendered into contemporary Latin, a task that was performed by such writers as Boethius, Martianus Capella, Cassiodorus, and Isidore of Seville. These literary works came to constitute that part of the curriculum known as the *rhetorical* studies.

Finally, further instruction was provided which was in some ways reminiscent of the early catechetical classes. The purpose of such instruction was to drill the students in the principles of theology. It must be remembered that from among these students the ranks of the clergy were to be filled. They therefore needed to be prepared to preach and teach in the parishes. The studies which fostered closer attention to theological matters were labeled *dialectic*.

Here, then, were the three branches of learning—grammar, rhetoric, and dialectic—which the medieval scholars came to know as the *trivium*. They constituted virtually the entire curriculum of the cathedral schools. Obviously, they were a far cry from the studies that had appeared under the same labels in the schools of pagan Rome, but they did provide the framework upon which a more elaborate content was to be built by the forces that would later bring about the revival of learning in Europe. Though the mathematical sciences were not unknown—especially fragments of the arithmetic, geometry, astronomy, and music which had been recommended by Plato and which had been known as the *quadrivium*—it seems that they were regarded primarily as literary works rather than as the disciplines Plato had intended them to be.

Meanwhile, the monastic orders also expanded and revitalized their teaching activities along the lines adopted by the cathedral schools. For the most part, the monastic schools were intended for members of the orders, but

they also sometimes admitted others. In fact, the monastic schools sometimes applied greater effort than did the cathedral schools in the field of scholarship. Moreover, they devoted themselves to reproducing by hand not only the Scriptures but also the writings of church leaders and other materials of interest. In this manner, the body of literature acceptable to the Christian schools as subject matter became more plentiful. As time went on, new schools were established and the number of students increased, even though

Fig. 34. Monks copying books in the writing room, or scriptorium, of their monastery. From a woodcut by Trostopiezel-Meisters.

formal education continued to be a privilege enjoyed by the wellborn and those who were joining the clergy. The medieval church made no special effort to teach even the elements of reading to the vastly greater numbers of laymen.

Chapter 13 will describe how in the twelfth and thirteenth centuries the intellectual interests developing around some of the cathedral schools led to the formation of graduate faculties in theology and law. It will be shown that as training for these professions was raised to a higher level graduate faculties came to demand a better literary background from those who wished to enter upon advanced studies. The work of the cathedral schools, accordingly, came to be restricted to language and literary studies. Because of their concentration upon Latin language and literature almost to the exclusion of all other studies, the cathedral schools then became known as *Latin grammar schools.*

Protestant Education

The revival of learning we know as the Renaissance was already making substantial headway in southern Europe in the eleventh and twelfth centuries. New intellectual interests appeared, and the development of university centers soon brought about the recovery of important parts of the literature of ancient Greece and Rome. Not the least of what was recovered was the

Fig. 35. An old print which portrays Luther upholding the Bible as the key to salvation whereas the Pope is shown holding the key in his own hands. This symbolizes a fundamental difference between the Protestant and Catholic theologies.

ability to read the languages of the older cultures. These language skills, especially the ability to read Greek, now enabled the scholars to go back in their search for Christian authority to sources that predated the writings of the church fathers and even the Vulgate translation of Scripture itself. In the process of searching the Greek and Hebrew sources of Scripture, a number of the clergy became convinced that some contemporary practices and teachings of the church were based on error. We saw in the preceding chapter that it was disagreements of this nature on theological questions that had brought about in France and Moravia the reform movements identified in religious history as the Waldensian and Hussite heresies. They were forerunners of the later and more successful reform movements headed by Luther, Zwingli, and Calvin.

It is our present purpose to examine the educational developments that followed from the Protestant Reformation. To understand them, it is necessary to summarize very briefly the basic differences which caused the Protestant leaders to break with the Roman Catholic Church. To that end, we must remind ourselves that Luther, Erasmus, and other members of the clergy of that day had acquired a considerable facility in the newly recovered Greek language. As a result of their scholarly studies, and in part as a result of the temper of the times, some of them became exceedingly critical of certain practices and aspects of doctrine promulgated by their fellow clergymen. There were a number who called for reforms, but for our present purposes it will be enough to summarize the story of Luther.

Luther is reported to have searched in vain in the original Greek versions of the books of the New Testament for authority to support the traditional powers exercised by the clergy or the role played by the church as mediator between God and His children on earth. In fact, Luther's studies convinced him that the church had no power to dispense the gift of salvation, for salvation, he concluded, was by faith alone. He came to believe that no good works, no intercession of one Christian for another or of the church for one of its members could influence God in this matter. Salvation was strictly a personal relationship between God and the individual, and the directions for establishing and maintaining this state of grace had been set down in the New Testament.

To Luther, as to other Reformation leaders, the Bible was the book of knowledge for which all men have need. The Old Testament portions of the Bible had been revealed to the prophets of old; the New Testament portion had been given in the teachings of Jesus and the apostles. Here, then, was knowledge of the good—all the knowledge man had received and all that he needed to guide him in living the best of all possible lives. Luther believed that the knowledge contained in the Bible must be accepted as an act of faith and used without reservation. Each individual must be given access to it and must draw his inspiration directly from it. To induce this faith in, and understanding of, the revealed way of life, Luther found it necessary to enlist the aid of education.

The Vernacular Reading Schools

Inasmuch as the common people of Luther's day used language quite different from the language in which the Bible was available at that time, they had no way of learning firsthand what was in it. Luther recognized at once that it would be impossible to teach everybody to read Latin and Greek to enable them to read the Bible for themselves. He found it much simpler to translate the Bible from the original Greek and Hebrew into the Ger-

man used by his followers. In translated form, the Bible could be understood by all German-speaking people when it was read to them. But, like the vast numbers of common people in all countries at that time, most of his followers were unable to read any language. Therefore, unless they were given instruction in reading they would become almost as dependent upon their Lutheran clergy as they formerly had been on the Catholic clergy.

Fig. 36. Gutenberg's first proof. The invention of printing made the Bible accessible to many people and thereby contributed to the spread of Protestantism. For that reason the authorities of the Roman Catholic Church placed Bible reading under a ban for all persons except members of the Catholic clergy.

It is for this reason that Luther directed a substantial part of the administrative efforts of the newly formed Lutheran Church to focus on establishing *vernacular reading schools* in the parishes. As the name obviously indicates, the instruction in these schools was offered not in Latin but in the language spoken by the people. The prime objective was to make each scholar capable of reading his own copy of the Bible in his own language. Luther believed that from such reading the religious and even the social reforms he believed were called for would follow inevitably.

Frequently, the only person available in a given parish who was able to

Fig. 37. Henry VIII receiving a copy of the Bible. Shortly thereafter he ordered that the people should be free to read the Bible.

read, and therefore qualified to teach others to read, was the minister. The first ministers were usually priests and monks who had left the Roman Catholic Church to join the reform movement. The reading instruction clearly served a religious purpose and was accordingly given a very pronounced religious emphasis. Pupils were expected to use their newly acquired reading skills to read the Bible, and Bible reading was begun almost as soon as the pupils had learned to recognize the letters of the alphabet.

Fig. 38. When Bible reading was made permissible people visited the churches to read the Bibles chained to the lecterns.

From these simple beginnings later reform leaders, especially Comenius, a Moravian bishop, moved to expand and improve the materials and the methods of instruction found in the earlier vernacular reading schools. Everywhere, however, the major emphasis continued to be that of giving all men —or as many as could be reached—the means for gaining personal salvation and for living the good life which had been revealed and recorded in Scripture. Establishing and maintaining reading schools therefore acquired the characteristics of a religious duty.

The interest of the Protestant reformers in offering instruction in reading marked the beginning of the parochial school movement identified with some of the same sects even to this day. It also reminds us of the interest shown by the Puritans and other Protestants in founding vernacular reading schools when they settled in America.

The Grammar Schools

Luther soon learned, as did other Protestant leaders, that when large numbers of individuals turn to the Bible for guidance each one is likely to read into it meanings that reflect his own problems and experiences. As a result, conflicting opinions arise about what is written there. Interpretations differed, so Luther thought, because the common people did not have access to the original languages and had not been trained to understand the cultural and social conditions within which Jesus and His followers lived and preached. To minimize the dangers of false doctrines, Luther became interested in training the clergy to correct the cultural deficiencies among the laymen and to help them interpret correctly. To this end, he directed that grammar schools be established modeled on those which had developed from the cathedral schools of the Catholics. The later grammar schools had come under the influence of the humanists, a group of Renaissance scholars who were instrumental in bringing about the revival of the culture of ancient Greece and Rome. Their movement and their schools will be described in Chapters 12 and 13. It is enough for our present purpose to note that they had substituted the Latin of Cicero and Vergil for the Latin used by the medieval scholars and had added the Greek of Aristotle and Homer to the curriculum of their grammar schools. To Luther, preparation in Latin and Greek grammar was precisely what was needed to introduce prospective Lutheran ministers to the Greek of the New Testament.

The Universities

The grammar schools were not intended to complete the education of the clergyman. The grammar studies they provided were but a preparation for the real training in theology, which was to be provided on a postgraduate, or university, level. We have not described the origin of the universities to this point because they, like the grammar schools of the humanists, belong to a different philosophical tradition and will be described in Chapter 13. Nevertheless, there were universities in many of the principal cities in Luther's time, and Luther turned to the universities in the countries that supported his reform movement as the schools in which to complete the education of ministers. Here the Latin and Greek studies which had begun in the grammar schools were continued and, in some instances at least, extended to include Hebrew to provide access to the Old Testament. Language studies, of course, were intended as aids in the primary task at hand, namely, the study of theology.

When the Lutherans and other Protestant sects enlisted the services of the universities in the training of ministers and other leaders, a number of

changes were called for. For example, it was necessary to staff the theological faculties with teachers sympathetic to the basic doctrines which had led to the break with the Roman Catholic Church. While the organizational structure of the university itself was not appreciably changed in the transition, the content of instruction was changed. Now greater emphasis was given to the study of the Scriptures in the Greek and Hebraic versions *as the book of knowledge*. This was a literary education with emphasis on grammar and rhetoric. Correspondingly less attention was given to dialectic and disputation; and the writings of the Catholic leaders, especially those who had come after Augustine, were generally dropped from the curriculum.

By referring to the description of the schools of New England given in Chapter 2, we can see that the educational system developed by Luther and his followers forecast the pattern of schools which later was adopted by the Puritans and other Calvinists. The same pattern of institutions and curricula was also adopted by other Protestant sects in America and elsewhere.

Revelation and Education

We have seen that wherever knowledge of the good has been said to have been given in revelation, education has been used to preserve and propagate the revealed word. This has of necessity resulted in a literary type of education. Among the more advanced peoples, the revealed word has been put into written form to ensure against its loss and entrusted to a priest class for safekeeping. The special duties of the priest class have tended to set them off from the rest of the people and to call for a special type of education to prepare them for their high calling. Education for the priesthood has tended to place major emphasis on learning to read the language in which the revealed word was originally set down and to master the words of wisdom it contains.

Today, education for the priesthood continues to bear the mark of language emphasis. Among the Moslems, whose sacred works are written in Arabic, the priesthood is schooled in Arabic. Among the Roman Catholics, whose official versions of the holy writings were set down in Latin, the religious schools put special value upon Latin studies. Among the Jews, whose sacred books are written in Hebrew, the religious schools provide instruction in Hebrew. And among the Protestant Christians, whose sacred works are written in Greek and Hebrew, the higher studies sponsored by the religious bodies almost invariably include courses in these languages.

In contrast to the extensive efforts made to educate the priesthood, the laymen as a general rule were not favored with comparable opportunities to obtain an education. In most cases, laymen had to depend upon instruction given orally in the synagogue, the mosque, the temple, or the chapel.

Only the Protestant sects, among the peoples of the West, were motivated on religious grounds to prepare a literate laity; and it is for this reason that mass education originated in the form of vernacular reading schools in the Protestant countries long before peoples of the other religious persuasions began to offer reading instruction in the languages spoken by their people.

Finally, it may be said that all education provided to foster dependence

Fig. 39. An early Arabian school. Discipline seemingly has been a problem for the teacher at all times.

upon the revealed word has been otherworldly in character. That is to say, knowledge and experience originating in this world have been portrayed as unworthy of the notice of the true believer. Whatever has given rise to motives contrary to the revealed word has been condemned as evil. Since the behavior of children and the uninitiated in general so often ran contrary to that of the disciplined believer human nature itself came to be regarded as evil. This view is with us yet in the doctrine of original sin. The services of the priesthood, and of education as an instrument of the religious organization, have been directed toward saving the individual from the powers of evil by turning him to the source of true knowledge. To this day, religious education exerts a disciplinary influence designed to subdue the original natures of the pupils and to turn their attention to the body of revealed truth which is believed to be the source of all knowledge of the good.

CHAPTER 9

THE METHOD OF UNFOLDMENT

More than two thousand years after Plato advanced the doctrine of reminiscence as his answer to the question of how man acquires knowledge of the good, Jean Jacques Rousseau announced another theory which, like that of Plato, also assumed that knowledge is, in a sense, within the soul when the individual is born. During the many centuries which separated the appearance of these two theories, the pagan teachings of Plato had been almost completely eclipsed in Europe by the Christian doctrine that knowledge is revealed. In fact, that doctrine had been spread so successfully that by the fifteenth Christian century political and social matters had become subordinated to the ecclesiastical authorities, and the heads of the Christian church had come to exercise, in the name of God, very extensive power over the greater part of Europe.

The sixteenth century produced the Reformation. This movement was, in effect, a challenge to the papal powers by other ecclesiastical groups which also claimed divine guidance and the authority to make decisions by the aid of knowledge revealed to them. The conflict of authority threw Europe into bloody turmoil. The resulting dissension, intrigue, and physical violence were to plague the people for many years. In the interests of self-preservation and peace, some reformers both within and outside the Roman Catholic Church turned for protection to local kings and princes. Thus assured of the loyal support of their subjects, the local monarchs found the courage to declare themselves independent and to repudiate the demands of Rome. It was in this manner that many of the modern European states were established. Each became an independent sovereignty, and each was ruled by its resident king. As the new states arose, the powers of the once all-powerful Holy Roman Empire decreased in inverse proportion.

Rise of Absolute Monarchies

In return for the protection the kings and princes gave them, some of the new religious bodies recognized their sovereigns as their spiritual as well as their civil rulers. The religious bodies which did so, as in certain German and Scandinavian states, thus became in reality national churches. The sovereign was made the head of the church, and the ecclesiastical system was adopted and supported by royal command. In all the new states the king came in time to be regarded as one who had been placed upon the throne by divine will. His subjects therefore were believed to owe him allegiance for religious as well as for secular reasons. The union of church and state in the person of the king placed in his hands so much power that his rule soon became just as absolute as had been that of the emperors and popes before him, and the resulting political organization is generally referred to as an *absolute monarchy*.

It should be noted again that the great concentration of power in the hands of the local monarch was encouraged because it was expected to bring an end to the bickering and bloodshed associated with the struggles among the various religious groups. The times were thought to call for strong-man tactics, and the local sovereigns, wielding absolute power, were expected to provide them. The sovereigns' claims to divine mandates to rule were supported by the clergy, and Biblical injunctions, such as the teachings of Paul quoted in Chapter 7, were submitted as evidence of divine approval of the arrangement. This view is known to us today as the *doctrine of the divine right of kings*.

The absolute powers exercised by the kings were justified on a second basis, the *doctrine of original sin,* the lesson which the religious for many centuries have drawn from the story of Adam and Eve. That story teaches that Adam and Eve were banished from Eden, the land of the good life, because they had sinned. Their sin has been shared by each of their descendants, and as a result each individual born into this life is a lost soul, ignorant of what is good and completely under the influence of the forces that relentlessly drive him to evil. Left to his own resources, natural man is said to be capable of doing only what is degrading and destructive.

This pessimistic picture of natural man was shared in part by Plato. We recall that he proposed to rescue mankind from the cave of darkness by turning to the leadership of his philosopher-kings. The Hebraic peoples turned to the words of their prophets for guidance out of darkness. The Christian Church taught that men could be saved from the sin of Adam and Eve by accepting the sacrifice of Jesus on the cross and by following the inspired teachings of the church. Now that the absolute monarchs also

claimed divine inspiration, it was said that the masses would be saved from their own ignorance and their natural disposition to do evil by obeying implicitly the commands of their king.

Fortified by these claims to a divine mandate and the religious doctrine of original sin, the absolute sovereigns logically took the next step. They said that every infraction of law proclaimed by the king was a sin against God. Those who rebelled against the king were quite readily convicted of being agents of the devil and were charged with working to overthrow and destroy the order established by God. Clearly, it was reasoned, the dissenters and the rebels must be put to death to safeguard those who were still loyal and to serve as a warning to those who might be similarly tempted. The sheriff and the hangman therefore came to aid the priest and the counselor in promoting the already substantial power of the sovereigns.

Revolt against Absolute Powers

In the early days of the absolute monarchies, the religious reformers were greatly encouraged by the changes introduced by their benevolent masters. It was not long, however, until the exercise of absolute power encouraged new forms of abuse. Monarchs began to compete with each other in the display of wealth and influence. Increasingly heavy taxes were levied on the people in order that the kings might build larger palaces and outdo their neighbors in rich and luxurious living. Obviously, the smaller kingdoms were at a great disadvantage in such competition, so their rulers were stimulated to try to increase their domains by whatever means promised to be effective. It was inevitable that war and intrigue, conducted with little regard for human rights and human life, should ensue, and the high hopes entertained by those who in the beginning had supported the local monarchs were not fulfilled.

History shows that when some of the religious people became aware of the manner in which their movement had played into the hands of scheming and avaricious rulers they renounced their undivided loyalty to the king and asserted a higher loyalty—namely, allegiance to God alone. Herein lies the basis for the struggle for freedom of conscience in the face of the claims of civil authority—a movement which ultimately produced the modern principle of separation of church and state. That, however, is a separate story, and we must return for the present to the theories for reform advanced by Rousseau.

By 1712, the year Jean Jacques Rousseau was born, the various monarchies of Europe weighed very heavily upon the people. The kings and their large retinues of nobles—all supported at public expense—ruled with a callous disregard for the well-being of their subjects. These were days when large

masses of people were excessively poor and relatively few were excessively rich. Agriculture was the basis of wealth, and commoners were generally forbidden by law to own land. In England, the beginnings of the wool industry had made sheep raising quite profitable. Lands which had formerly been tilled as small holdings and had thereby provided a living for a large segment of the people were now turned into sheep pastures which could

Fig. 40. The misery of the peasants has received the attention of artists as well as writers, some of whom may have drawn upon their imaginations as heavily as upon the facts.

be tended by two or three shepherds. The rest of the people were displaced from the land and were driven to seek a living in the cities, which offered them very few opportunities, indeed. Lack of food, overcrowding, the extremely unsanitary conditions in the populous places, and ignorance of even the simplest rules of hygiene exposed the people to the ravages of disease which at times reached epidemic proportions.

Coupled with the physical hardships were the cruel and unreasonable laws which had been issued to keep the displaced people under control. We need only recall the gruesome debtors prisons, the galley ships, and the gallows and guillotines which stood in public places ready for use at exceedingly frequent intervals to catch a glimpse of the social conditions against which Rousseau was soon to rebel.

In spite of the prisons and the public executions, the seventeenth century

had produced a considerable resistance to the unlimited powers of the absolute monarchs. By the beginning of the eighteenth century, there had already been a surprisingly large number of intellectuals who had come to question the claims of the rulers to divine guidance. How, it was asked, could rulers claim to be administering in the name of God when they allowed such misery and corruption to flourish although they had absolute powers to do what they wished to correct them? As the doctrine of the divine right of kings came in for critical attention, the reaction from those in power was both quick and harsh. Fortunately, in those days a critic of his own king—for example, the king of England—sometimes received a ready welcome from the king's enemy, such as the king of France. Thus, by living a kind of fly-by-night existence, some of the rebellious critics escaped arrest and were able to make their views known.

Rejection of Doctrine of Original Sin

The same types of experiences which led some to challenge the doctrine of the divine right of kings now also brought the doctrine of original sin under examination. Despite the fact that the doctrine had been taught by the Christian Church for centuries and had become deeply entrenched in the intellectual as well as the religious attitudes of the people of Europe, doubts were fed by observations that the cities which were under the immediate surveillance of the king and his agents were notoriously corrupt. In contrast to these unsanitary, immoral, and disease-ridden centers of population, the good, clean smell of the fields and forests appeared like remnants of a lost paradise. Then it was observed by some that the simpler and less sophisticated country people had less quarrelsome and more charitable natures than did the inhabitants of the cities and that they enjoyed better health as well. Also, adventurers newly returned from America were bringing back glowing accounts of the noble savages and of their ideal social arrangements. Nature, which had been suspect by Plato and the theologians alike, now came to look clean and inviting. The natural life, generally identified with the forces of evil, now came to be praised as a way of life markedly superior to the artificial and corrupt practices found among the social leaders of the day. In brief, a back-to-nature movement had already got under way on a minor scale even before Rousseau published his challenging theories of social reform.

Theory of Natural Goodness

Rousseau, like other critics of his day, was unable to account for the injustices and vicious conditions he observed about him by blaming them

upon the evil nature of men. He reasoned that all things had come from the hands of the Creator in a good and perfect state. Before organized social systems emerged, natural man had lived peacefully and in harmony with his fellows. A bountiful nature had supplied all his physical needs. In this natural state, the natural man had had no desire for private property, hence no reason to exploit his fellow men or to create an economy of scarcity.

Rousseau taught that the first evil, from which sprang all subsequent corruption, appeared in the original state of nature when the first man asserted a claim to a certain parcel of land or to an implement which had formerly been owned in common to be used freely by all. It was this assertion of private-property claims that started society on its downward trail, so reasoned Rousseau. Later, to protect private-property claims, it became necessary to make laws, prescribe modes of punishment, establish police forces, build jails, and establish courts of record and justice. Each institution and every arrangement pushed man further along the road to corruption and encouraged the exploitation of man by his fellows.

For Rousseau, the obvious and only way to escape the present troubles was for man to make a new start by returning to a state of nature. He did not believe that man must abandon all organized social life. Rather, man must learn to follow nature in constructing a better set of social arrangements. Rousseau believed that the abuses of his day were the products of the distorted personalities and the erroneous lines of thinking produced as men grew up in unnatural environments. In their artificial social settings, older generations corrupted their youth by imposing upon them the evil ideas and practices which they in turn had learned from their own forebears.

Though the weight of tradition was against him, Rousseau's logic appeared rather convincing to many of his contemporaries. Men do evil, he reasoned, only when their souls have acquired an evil nature. They do good as long as their original natures remain unspoiled. Rousseau reasoned further that if we accept the doctrine of original sin, as well as the doctrine of special creation, both of which were taught by the church, it must follow that God, the All-Good, created bad souls to inhabit the bodies of babies. However, this would be inconsistent, for how can God be all-good and yet make bad souls—especially since He is just as capable of making good souls? It requires a bad person to do or make something bad. Therefore, to attribute to God the creation of bad souls is to deprive Him of the status of the All-Good. This was a conclusion which Rousseau would not accept, and he escaped the difficulty by substituting for the doctrine of original sin the *doctrine of natural goodness.*

It is this theory—namely, that the child receives from his Creator a disposition to live properly and in accord with the wishes of God—that set

Rousseau's teachings apart from those of the church. His doctrine was condemned not because it was antireligious but because it was unorthodox and tended to make the sacraments of the church unnecessary to save the individual from evil.

In the years that followed the influence of Rousseau in intellectual circles was very substantial. It is clearly evident in the following lines from Wordsworth:[1]

> The Soul that rises with us, our life's Star,
> Hath had elsewhere its setting,
> And cometh from afar:
> Not in entire forgetfulness,
> And not in utter nakedness,
> But trailing clouds of glory do we come
> From God, Who is our home:
> Heaven lies about us in our infancy.

Reform through Education

It must be remembered that Rousseau was not trying to destroy Christian doctrine but rather was seeking to bring about much-needed social reforms. Like Plato and the prophets before him, he was calling upon men to mend their ways. Also like them, he was looking to a realm beyond the senses to give guidance to the process of reform, and to the soul as the agency by which the necessary knowledge is brought to human consciousness. Unlike Plato and the prophets, however, he held that the basis for right thinking is implanted in the soul at birth where it needs merely an opportunity to grow or unfold before it becomes available for man's use. The soul receives the imprint of knowledge of the good at the time it is created. Unfortunately, however, the guiding influence of that God-given nature is not effective at birth, for it is present in embryonic form only, something like the gene pattern within a seed. Does not the acorn contain within it the form of the perfect oak? Will it not produce the mature tree under the right environmental conditions without having a pattern forced upon it from without?

So also with the soul of man, reasoned Rousseau. Remove the child from the corrupting influences of society as it is presently organized and place him in an environment in which the implanted tendencies may emerge naturally and without deforming restraints. His resulting nature will be that of a truly noble individual who will work intuitively to make truth and justice prevail and who will withstand the pressures of social practice and

[1] William Wordsworth, "Intimations of Immortality," in *The College Book of Verse,* Boston, Houghton Mifflin Company, 1927, sec. V, p. 328.

deep-seated tradition whenever and wherever they are found to be wrong. In the place of existing abuses and corruption the natural man will put forms and arrangements that are good.

Rousseau believed that the natural goodness of man cannot be utilized unless the individual has been properly brought up. It was through education, therefore, that Rousseau hoped to reconstruct society by bringing up a continuous flow of individuals trained to follow their natural bents. The education he wanted must leave the soul of his pupils unspoiled. It must therefore be an education that fosters growth *from within* rather than one that seeks to impose a pattern from without. The nature of the educating process by which he proposed to achieve these ends will be described in greater detail in Chapter 10.

The Good Society

Rousseau's theory that the individual derives directly from the hand of God a disposition to know and to do good had important social consequences. It helped foster the rebellion against authority which produced both the American and the French revolutions. It helped elevate the individual to a position of importance and self-respect. His new-found status encouraged him to stand against the indignities he had been forced to endure at the hands of an entrenched ruling class. From this theory also flowed a belief in the equality of men. It encouraged the common man to reject laws and arrangements which had established and preserved a social-caste system. Now commoners and aristocrats alike were persuaded to trust their inner feelings when passing judgment on the rightness or wrongness of specific social practices, and to trust those feelings in the face of whatever hardheaded logic the defenders of the established order advanced. In this sense, Rousseau can be said to have advanced the cause of freedom of conscience and the doctrine of the natural rights of man and to have helped prepare the way not only for political liberty but also for the romanticism of the nineteenth century.

There is another side to Rousseau's social influence. In *The Social Contract,* published in 1763, he described the good society as an association of individuals within which each member acquires new status and potentialities, including freedom, as a consequence of his membership. He claimed that a society formed by individuals thus banding themselves together acquired the status of an organic entity which "lives its own life, fulfills its own destiny, and suffers its own fate." Beyond this, it has a will of its own. Thus: "If the state is a moral person whose life is the union of its members, and if the most important of its cares is the care for its own preservation, it must have a universal and compelling force, in order to move and

dispose each part as may be most advantageous to the whole." [2] What Rousseau was attempting to prove was that the sovereign state, created by its members when they enter into their social contract, becomes an entity superior to the individual, and it has a duty and a right "to compel the individual to be free."

In the writings of Rousseau it is difficult to reconcile what appears to be a hopeless conflict between rugged individualism on one hand and a form of statism on the other. It is not our purpose to attempt such a reconciliation. What does seem important for us is Rousseau's apparent belief that a society made up at least in part of men who have recourse to the guides to right thinking and acting implanted in their souls by the Creator will be able through *parliamentary procedures* to bring forth knowledge of the good. This knowledge will be in the form of social truth and was referred to as *general will.* General will, so arrived at, had for Rousseau the status of an absolute, a dictate from heaven bearing the stamp of the approval of God. The good society, therefore, must work to bring forth the general will. To this end, parliamentary procedures are to be substituted for government by a ruling class. When such a society has brought forth and adopted general will as the law of the land, the society must also force reluctant individuals to conform *for their own good.* Deviations from the general will must not be permitted for the simple reason that there was for Rousseau only one form of the good and it was to be made known in the general will.

The importance of education, and particularly of an educational process which follows nature as its guide, is found in the distinction Rousseau drew between *general will* and the *will of the people.* The former is always true, Rousseau believed. It is an absolute brought to light by individuals each of whom has access to the same truth, a truth that has its origin in the realm of the supernatural. The will of the people, in contrast, is merely opinion which is given expression, or approval, by most of the people. It has no other basis than everyday experience and may be—indeed, usually is—wrong. The will of the people is thus found merely by counting the votes. It is not a way of establishing truth, so Rousseau believed, simply because the opinions of the individuals whose judgments have been counted probably have not learned to follow their own, God-implanted inner guides to truth and morality.

It is clear from the foregoing that Rousseau did not place his trust either

[2] Jean Jacques Rousseau, *The Social Contract,* II, iv, as quoted by George H. Sabine, *A History of Political Theory,* rev. ed., New York, Henry Holt and Company, Inc., 1950, p. 589. Slightly different wording will be found in other sources, as, for example, Charles M. Andrews, *Famous Utopias,* New York, Tudor Publishing Company, 1946, p. 25.

in popular government or in majority rule as the means to bring about social reform. His appeal to parliamentary forms in opposition to government by decrees issued by the absolute monarchs was based on the assumption that parliamentary governments could be brought under the control of men trained to follow their God-given intuitions. It was this dependence upon the moral guides implanted in the soul—and not faith in the processes of free examination, discussion, and common consent—that he expected to make his natural men the exemplary leaders needed to bring about the desired reforms. Thus, it was to the process of education by which such men are to be produced that he turned as the starting place for reform.

It is now time that we examine in closer detail Rousseau's theories on how to educate in order to bring from the soul the knowledge of the good he believed was implanted therein.

CHAPTER 10

LEARNING TO BRING FORTH KNOWLEDGE IMPLANTED WITHIN THE SOUL

MANY historians say that modern education began with Rousseau. Certainly many ideas, terms, and practices we encounter in the literature of modern educational methodology resemble those of Rousseau's which shocked the people of his day into making a new beginning. Pestalozzi, Froebel, and Herbart drew many of their basic ideas from Rousseau, and they are the three educators whom we associate most closely with the beginning of modern education. But the theory, the reason for which Rousseau advocated changes, is not generally accepted today, and it is sometimes difficult to distinguish between practices that serve the ends in which Rousseau believed from similar practices that are used by teachers in our time to reach quite different ends.[1] That is to say, in the opinion of some, too close attention to terms, practices, and methodologies has merely led to a confusion of the ends which our educational efforts are intended to serve. To assist in making the necessary distinctions, the educational theories of Rousseau are reviewed here in greater detail than they would otherwise merit.

Child Nature Is Good

Rousseau's basic educational principle was clearly stated in the opening sentence of his major work on that subject, *Émile,* his proposal for the education of a hypothetical boy. "God makes all things good," he wrote. "Man

[1] See Boyd H. Bode, *Progressive Education at the Crossroads,* New York, Newson and Company, 1938, for an analysis of this difficulty.

Fig. 41. Rousseau and Madame D'Epinay whose support made it possible for Rousseau to spend time in literary pursuits.

meddles with them and they become evil." He meant that the child comes into this world with a nature that is potentially good. The disposition to know and do what is good is given the child by his Creator. It follows that if the original natures of children can be preserved by shielding them from unwholesome contacts with the man-made environment, we may hope to bring up a generation of noble citizens who will live the way God intends that men should live. The shielding role Rousseau assigned to education; and it was through education, therefore, that he hoped to reform society and to maintain it on a high moral plane. But, as he realized, the education needed in order to achieve this goal must be radically different from the education that had brought up the generation of adults of his day.

In analyzing the educative process, Rousseau observed that three factors are involved. First, there is the education of nature, which modern psychologists are inclined to call the *maturation process*. Second, there is the education of things, which we today are likely to call *sense experiences*. Third, there is the education of men, which is known today as *social experience*. Rousseau maintained that when all three of these factors are brought into agreement the child will grow into a well-balanced, self-assured, informed, considerate, and socially competent individual. That is, the child will become in reality the good man God made him potentially. If this can be brought about, his adult judgments on personal as well as social matters will be directed solely by his God-given instincts of morality and justice and not by any of the principles which he had acquired from his social environment.

In commenting further upon the method called for if we are to educate in light of the three factors stated above, Rousseau wrote:[2]

> Now concerning these three different educations, that of nature does not depend upon us at all; that of things only in certain respects. That of men is the only one of which we are really masters, and even here our control is not complete for who can hope to direct the words and actions of everyone with whom the child comes into contact?
>
> Thus, if education is regarded as an art, it is almost impossible for us to make it succeed since the controls necessary for success are not within our power. All that we can do by dint of solicitude is to move in the general direction of our goal, but good fortune is necessary if we are to attain it.
>
> What is this goal? It is the goal of nature, as we have already proven. Since the cooperation of the three educations is necessary for their success, it is that one over which we have no control to which we must relate the other two.

[2] Jean Jacques Rousseau, *Émile, ou Traité de l'Education,* Nouvelle Edition, Paris, Librairie Garnier Freres, p. 3. This and subsequent selections are based on literal translations of the French text by Frederick J. Zilli.

Education Must Be Permissive

If it is the education of nature, the unfolding process which is beyond the control of the teacher, which is to set the pace for the education of things and of men, the latter two must not be forced upon the child. Rather, the teacher must learn to wait for signs of the internal stirrings which signal the learner's readiness to progress to new things and new social experiences before he is exposed to them. Therefore, Rousseau reasoned, education must provide a permissive atmosphere, one in which things and men are not allowed to dictate to the child what must occupy his attention now or what he must do next. Four maxims, as Rousseau called them, show the extent to which he would have education be a permissive process in which nature is allowed to take the lead. They are:[3]

First Maxim. Far from having superfluous strength, children do not have strength enough to do all that which nature demands of them; it is necessary then, to let them use all they have for they will not know how to abuse it.

Second Maxim. It is necessary to help them and to supply them with what they lack, be it intelligence or strength, in all their needs that arise from the body.

Third Maxim. When rendering assistance it is necessary to limit oneself to that which is really needed, without granting anything to caprice or to desire without reason, for caprice will not torment them if we do not cause it to be born, seeing that it is not of nature.

Fourth Maxim. It is necessary to study carefully their speech and signs, so that, at an age when they do not know how to conceal, we distinguish in their desires that which comes directly from nature and that which comes from opinion or perversity.

The spirit of these rules is to accord children more true liberty and less authority, to allow them to do more for themselves and require less of others. Thus, learning early to limit their desires to their own strength, they will not feel the need for things which are not within their power.

Rousseau believed that if the four maxims were observed it would be possible for nature—that is, the maturational process—to set the pace and tone of education. Modern educators, aided by studies of child growth and development, regard this as a necessary consideration. Thus, we now speak of readiness to learn as an essential factor in all successful learning. But in Rousseau's time this was looked upon as a revolutionary idea.

Original Nature Must Unfold

We must bear in mind at all times that Rousseau was endeavoring through his writings to correct what he regarded as social and educational error in

[3] *Ibid.*, pp. 44–45.

his day. At the time he wrote, children were not generally permitted to enjoy what we would call a happy and carefree childhood. It appears from historical accounts that, except for the fact that they had smaller bodies, children were treated as adults even in their early years and were expected to participate in the activities of their elders. They were expected to show the same interests, to enjoy the same foods and drink, and to engage in the same pastimes and occupations. They were taught to gamble, to participate in adult social activities, and in general to practice the vices as well as the virtues prevalent in adult circles. They were also expected to exercise mature judgment. Hence, they were subject to the same rules and were given the same punishments meted out to adults. Apparently, the concept that child nature and understanding are different from adult nature and judgment had not gained a foothold at that time.

To the tendency to treat children as adults Rousseau offered strong protest. To him, the moral principles and natural tendencies which he believed are implanted in the soul of the child are not ready to function at birth but require a period of development before they reach the state of full effectiveness. Therefore, the child is not ready to exercise adult judgment and to assume adult responsibilities. Childhood is a period that should be kept sacred for the use and enjoyment of child natures. It should provide opportunity to engage in activities and to call for the exercise of judgment commensurate with the abilities and understanding of the child. Thus, if one would learn to educate properly, Rousseau said, it is necessary for him first to study children and to learn thereby what is needed and appropriate at the different ages.

After considerable thought on the matter, Rousseau decided that the unfoldment process has four distinct stages. The first is the period of infancy, which ends at the age of five or six. This is followed by the period of childhood, which continues to the age of twelve. Then follow three or four years, which he identified as the age of developing reason. Finally, the awakening social awareness of the individual, following his fifteenth year, marks off the last stage before he enters into full standing as an adult. Each of these stages, Rousseau said, calls for a distinctive type of educational treatment, and in each stage the permissive attitude must be employed if nature is to point the way.

The Infant

Rousseau indicated that it was the custom among the higher social classes of his time to put infants in the care of servants or to place them in the home of peasants, where they would be cared for until they were old enough to be brought back into the parental household. The women of society apparently

had no time for their children, and family life as we know it did not enjoy social favor. Children thus spent their first years in ignorance of their parents, and, according to Rousseau, some of the most favorable years for bringing out the best in the nature of the child were used to fasten upon him base practices and degrading tendencies.

To avoid forcing the infant to draw his emotional as well as his physical sustenance from a menial, Rousseau urged mothers to nurse their children. If this was impossible, the mother was urged to assume full responsibility for bathing, clothing, and watching over her infant. She should keep him by her side as much as possible and should at all times give free rein to her natural tendency to show affection. This, Rousseau said, is the natural relationship, and in this natural environment the child will find a welcome response to his awakening natural tendencies to be cheerful and to love others. Today, we are likely to speak of the child's need for security if he is to develop a wholesome personality.

Rousseau also took note of the fact that servants, and even parents, when they do not permit the natural bonds of affection to develop, usually seek to end as soon as possible the period during which the child is physically dependent on them. They try to train the child to conform to adult standards and to force his still soft, pliable nature into an adult form. Now the full import of Rousseau's principle of permissiveness came to the fore. In answer to the question of what should be done by way of training the infant, he wrote, "A great deal, but clearly it is to prevent anything from being done." [4] To this end, he urged that the infant and his mother be taken from the crowded and confining environs of the city to live in the comparative freedom of the open country. There it would not be necessary to keep the child confined in a room to isolate him from the normal pursuits of life. Both mother and child would benefit from the fresh air and sunshine of the country and would be free to move about without fear of contamination or accident.

Nor should the baby be clothed in garments that would restrict his movements or protect him needlessly against the temperatures of the atmosphere. The child should be lightly clothed so that he might exercise his arms and legs freely. Also, he should be allowed to play in the sunshine and roll on the grass. He should be accustomed gradually to being bathed in cold water so that he might become hardened and ready at a later stage to bathe in the streams and pools of the forest. The parent should refrain from using medicine and avoid the ministrations of the physician, which were the fashion of the day. Rousseau wrote that these were "the amusement of the idle and the unemployed, who have no better use for their time than to spend it taking care of themselves." Except in instances of extreme emergency, temperance and industry were the only medicines needed, he said,

[4] *Ibid.*, p. 7.

as proved by the health and strength enjoyed by men, women, and children who lived in the country and enjoyed the natural life.

Rousseau made much of the importance of sense experiences in this as well as in later stages of education. Some of his followers, notably Pestalozzi and Froebel, made sense experiences central in their educational methodologies, as we shall see in Chapter 15. But for Rousseau, sense experiences were to be used as aids in developing the latent judgment of the child and were especially important during infancy and early childhood, when the higher intellectual processes had not as yet begun. Since these data were said to be material with which the thought processes would later deal, Rousseau was concerned that the child should acquire them in a "fitting order, so that memory may at a future time present them in the same order to his understanding." [5]

Similarly, Rousseau was anxious that the child should observe the natural connections between things and the ways in which they affected him. To this end, he urged that the child be permitted to touch and handle everything, for it was only by doing so that he would learn: [6]

> to perceive the heat, cold, hardness, softness, weight, or lightness of things, to judge their size, their shape and all their perceptible qualities, by looking, feeling, listening, especially while comparing the sight to touch, while estimating by eye the sensation they would cause under his fingers.
>
> It is only by movement that we learn that there are things apart from ourselves; and it is only by our own movement that we acquire the idea of space.

We should note again that Rousseau did not mean to suggest that sensations provide the materials out of which knowledge is built. Rather, they provide the raw materials with which imagination, memory, and reason must later work. True knowledge is derived not from the sensations but from the process of manipulating them. True knowledge is knowledge that enables men to judge the things and events from which the sensations arise. The bases of such judgments are inherent in the soul and were implanted therein when the soul was created. Thus, the inherent principles of morality and justice will enable the mature individual to judge things and events; but the latter are not to shape the former.

Returning once again to the principle of permissiveness, Rousseau said that the child whose native tendencies are thwarted at every turn by the will of man lacks the opportunity for his reason to be brought to full maturity. When his natural inclinations are overpowered by the opposition and demands of his elders, his emotions are aroused. He becomes a troublesome individual and tends to be thoughtless toward others because others are in-

[5] *Ibid.*, p. 39.
[6] *Ibid.*

considerate of him. Therefore, Rousseau urged, the child should not be opposed by the will of man, but only by things. In this way, he will be curbed only by the natural consequences of his acts, and his sensory experiences will reinforce his natural inclinations.

When children are taught to speak, they should be allowed to develop their language abilities in their own ways. Rousseau said that children employ a grammar all their own. Their usages are reasonable to them and they should not be corrected and made to conform to the rules of grammar employed by adults. However, parents and teachers must take care always to speak clearly and correctly in the presence of their children, and thus they will correct and form usage by example rather than by force. Also, they should make certain that the children gain satisfaction from their efforts to communicate. Children must not be forced to attempt speech beyond their limits of understanding or ability. In Rousseau's judgment, pressure imposed by others will only induce defective and confused speech, especially with respect to pronunciation. Rousseau made much of the importance of letting the child discover through his own needs that the function of language is to communicate ideas. When the child has learned that he must convey his meaning to another, both the words he chooses and the tones he employs will be made to fit the situation. In this manner, his speech will always be both natural and effective.

Perhaps Rousseau's views on the subject of the education of the infant can best be summarized by his statement that nothing should be done that would force or distort the development of the inborn tendencies, "only taking care that [the children] do not fall, and keeping out of reach of their hands all that which can hurt them." [7]

From Five to Twelve

Rousseau believed that the child who has been reared according to the foregoing principles will have developed a significant amount of independence and self-assurance by the time he is five. He will no longer be dependent upon the help and comfort of his mother or nurse. He will have learned that he cannot command others by tears and temper tantrums. He will bear his bruises and bumps without whimpering because he learned in infancy that crying will neither heal them nor bring someone to console him. Rousseau boasted that the child brought up in his manner will "often have bruises; on the other hand he will always be gay: yours who have fewer, also are always disappointed, always thwarted, and always sad." [8]

Rousseau pressed the case for freedom for his pupil by pointing out that

[7] *Ibid.*, p. 45.
[8] *Ibid.*, p. 56.

less than half the children of his day lived beyond their fourteenth birthday. Why, then, should they spend all their time preparing for adult life when only about half of them will live that long? It is better to let the children enjoy the wholesome activities typical of their age, for in them they will receive the best possible mental preparation for life, and those who do live to maturity can readily acquire the specific information and skills they will need when they are older.

Furthermore, Rousseau continued, a child free to try his strength in harmless pursuits soon learns the limits of his strength. He is restrained by things rather than by the will of man. His freedom allows him to try his natural talents in a variety of ways, and he thereby discovers wherein his real talents lie and may, indeed, uncover potentialities of which there was no previous indication. In this way, the child finds his natural place in the world and learns to live contentedly in it. It is in this way that he becomes a truly free man, for a free man wills only what he is able to perform and performs what he pleases. This, Rousseau said, is the fundamental maxim from which "all the rules of education will naturally flow."

Inasmuch as Rousseau did not think that a child is capable of reasoning before the age of twelve, he insisted that before the age of reason his pupil would be given no verbal lessons but would learn only by experience. He would not be punished, for he would still be unable to know right from wrong. Those who might fear that this lack of restraint would produce a boisterous and unruly child were assured that it is only those who have been restrained unnecessarily who do the forbidden when there is nobody around to restrain them: [9]

> Two school boys from the city will do more damage in an open place than the children of an entire village. Shut up a young gentleman and a young peasant in a room; the former will have upset everything, broken everything, before the latter will have left his place. Why is that, if it is not because the one hastens to abuse a moment of liberty, while the other, always sure of his liberty never is in a hurry to use it.

As Rousseau took up the education of his pupil during the second stage, he asserted again the importance of direct sensory experiences. Such experiences, he said, have special importance at this stage because the pupil is particularly sensitive and impressionable. The things he sees are fixed in his memory, where they are stored for use by his reason and imagination in later stages. It is extremely important, therefore, for the child to be shielded from all harmful experiences and especially the vices and abuses which are practiced by persons of high social standing. To this end, he urged that two specific measures be taken. First, the child should now be taken to live

[9] *Ibid.*, p. 76.

in the country, "far from the miserable lackeys, the most vile of men after their masters; far from the low morals of the cities whose gilded surfaces make them seductive and contagious to children; whereas the vices of the peasants, without adornment and in all their grossness, are more likely to repel than to seduce, those who have no interest in imitating them." [10] Furthermore, country life will provide the child with more direct contacts with things and their natural relationships. The lessons drawn from contacts with nature will be both simple and vivid. The consequences of acts involving things will follow immediately and directly, and for that reason the relationships between acts and their natural consequences will be observed correctly by the pupil.

The second measure recommended was to place the pupil in the care of a proper tutor, one who will encourage the development of self-control by good example. Since the tutor will be in close and continuous contact with the pupil through this and later stages, adequate steps should be taken to ensure that the tutor himself will not exhibit or countenance those vices found in the city from which the pupil is to be withdrawn. Equally important, the tutor must understand and be skilled in the ways of educating according to nature.

In teaching self-control Rousseau would have the tutor use the methods of direct observation and experience. For example, suppose that, while walking through the countryside, Émile, the imaginary pupil, and his tutor chance to come upon a man shouting and raging in a fit of anger. The tutor should say to Émile that the man is ill and in a fever. Impressed by what he has seen, Émile will then ask questions and the tutor can in a few words give him some idea of what it means to be sick, of disease and how it affects the way people behave. Thus, Émile will come to shun passions because he now looks upon them as diseases, an attitude which will be much more effective than any sermon in giving direction to Émile's future behavior. Furthermore, it will lay the basis for treating Émile himself as a sick child should he ever give way to an outburst of anger.

Rousseau proposed to employ direct experiences in developing other controlling ideas and principles. He gave as an example the process by which he would have the tutor establish the idea of property. In that example, the tutor will permit Émile to plant some beans after he has become interested in doing so from watching the gardener at work. After many days of hard labor and careful attention, he will become emotionally attached to his tender young plants. Much to his horror, however, he will arise some morning and find that his garden had been uprooted. Inquiry will soon reveal that it was the gardener who did the damage. When Émile complains, the gardener will explain that in planting his beans, he, Émile, destroyed the gardener's

[10] *Ibid.*, p. 80.

planting of very fine and expensive melons. As a result of his own bitter disappointment, Émile will now be able to understand why the gardener was indignant. He will also realize that he violated the property rights of the gardener, and this knowledge will now make it possible for him to go to the gardener and work out a mutually satisfactory arrangement to protect the property rights of each in the future.

We see in each of the above examples how principles of right action were to be brought out of the direct experiences of the pupil. This was not the practice in Rousseau's day, for he noted how instruction was generally forced upon children before their ability to reason had matured. Among the specific studies he condemned for this reason were the foreign languages, especially Latin and classical Greek, which were no longer spoken languages in his time. History and geography were equally objectionable, for, according to prevailing practice, these subjects also purported to teach the facts first on which reason would later depend. Nor did he place much faith in the use of fables to teach lessons of morality and courage. He felt that the lessons in parables which seemed so obvious to adult eyes lay far beyond the reach of the child's understanding and, therefore, either were not grasped at all or became associated with the unpleasantness that children experienced when they were forced to give attention to them.

Even reading instruction was not to be forced upon Émile. In fact, it seems that Rousseau would have preferred that Émile reach the age of twelve scarcely knowing what a book is. On the other hand, he would have Émile receive letters and notes sent him by his family and friends. These he believed would arouse Émile's curiosity, and he would want to learn their content. These messages should be Émile's reading textbooks, and the only instruction given him should be what would help him decipher the particular messages he received. But even here, Émile must always ask for the help, for instruction must never be forced upon him.

After Rousseau had rejected so much of the standard educational practice of his day, he turned to the more constructive aspects of his theories. Thus, he directed that the tutor should look after Émile's physical development. Émile should be enticed into playing games. The games selected should involve much physical exertion so that his body would grow strong and his disposition cheerful, eager, and confident. Émile's food should be plain but wholesome, and his taste should be trusted to provide a well-balanced diet. His rest should be according to need, and Rousseau cautioned against fixing too firm a habit regarding the hours of sleep. Rousseau believed that if a mistake was made in this matter Émile might lose the flexibility and adaptability which would be required of him when he entered upon the life of the adult. His clothing, too, should always be of such materials and style as would permit freedom of movement. This rule should be employed especially with

respect to shoes. It is interesting to note that on this point Rousseau believed it would be best to let Émile run barefoot except in extremely cold weather.

Because he attached such great importance to the sense experiences that were to be derived from direct contact with the environment, Rousseau could not resist the urge to provide for his pupil some special training in making observations. To this end, he urged that games be employed and special activities designed that would require Émile to give attention to certain aspects of his surroundings. Rousseau especially advocated those activities which would require Émile to estimate the weight, size, temperature, and other physical properties of objects merely by looking at them from a distance. Training in making observations was to be provided by having him make estimates at a distance, which would be verified and corrected by a closer inspection. Interestingly enough, Rousseau believed that the basis for geometry could be provided in this way simply by having the pupil observe the shapes and relations of various geometrical figures. The benefits of such training were thought to be obtained not from the proving of theorems, which Rousseau would have omitted entirely during this period of the pupil's life, but from the sense experiences derived from having him carefully draw the figures and superimpose one figure upon another.

Rousseau was convinced that by the age of twelve the opportunity to live in close contact with nature and the simple social life of country people and the freedom to explore, to inquire, and to experiment as his physical strength permitted would inevitably make Émile a healthy, good-natured, and well-behaved boy. He would be free from the illnesses which usually afflict children. He would be cheerful in disposition, considerate of others, confident, and accustomed to depend upon his own good judgment rather than always being dependent upon others. He would be equally at ease among men of low estate and in the society of the well to do. He would be as much at ease with adults as with children. Absent from his nature would be prejudice and deceitfulness. He would be neither arrogant nor unruly. Nor would he mistake for true knowledge the mere recital of words and symbols committed to memory without understanding. In brief, Émile would now be ready to undertake that type of education which has as its major objective the development of the mental powers which Rousseau believed would just now be beginning to emerge.

From Twelve to Fifteen

The years immediately preceding puberty were, in Rousseau's opinion, very valuable ones from an educational point of view. During these years physical strength begins to exceed the bodily wants. Although the boy's strength is not equal to that of a man, it is more than enough to satisfy all

his needs. He is, therefore, relatively stronger at this age than during any other time in his life. This is a golden opportunity which, Rousseau said, must be used to store up knowledge and skills "in the hands and the head." This is the time for work, instruction, and inquiry.

In view of Rousseau's theory that nature must take the lead, we may well ask what he would have the tutor teach Émile during this, the third distinct period in the pupil's life. He answered that Émile must learn not only what is but also what is useful. This marks the beginning of the training of judgment and reason. Care must be taken, however, to omit whatever requires a full-grown mind to understand; and especially those things must be avoided which, to be judged properly, suppose a knowledge of man's relationship to his fellow men—a knowledge which Rousseau said no child can acquire.[11] Nor would Rousseau have Émile study the conventional subjects, read textbooks, or undertake lessons in the ordinary manner. On this point Rousseau was very specific. "It is not a question at all of teaching him the sciences, but of giving him a taste so he will come to like them, and methods of learning them when this taste is better developed. That certainly is a fundamental principle of all good education."[12]

It is from his account of the way in which Émile's emerging powers of reason and judgment are to be nurtured that we derive some of the most revealing descriptions of Rousseau's philosophical ideas, particularly with respect to how he would have nature lead the way in education. Thus, when Émile has developed the ability to distinguish between what is useful and what is useless, as in the studies in geometry undertaken before the age of twelve, Rousseau said it is time to introduce him to more theoretical matters. The move must be made step by step, however, and progress must always be made by moving from the graphic and concrete to the theoretical. Émile's theoretical studies must begin with direct experiences, and only after contact with and observation of things will he be ready to consider the nature of their relationships and connections. Émile must never be rushed in this process, for there is much more danger in forming wrong or erroneous ideas than in forming no idea at all.

Furthermore, though Émile is now able to distinguish between the useful and the useless, he is not yet ready to distinguish between right and wrong. The tutor should make no effort, therefore, to teach moral ideas. It is enough if Émile approaches the realm of theory merely from the standpoint of determining what is a thing's usefulness. After he has learned to distinguish between the useful and the useless, there will be time for him to take the next step—namely, that of distinguishing between the proper and the improper and between right and wrong.

[11] *Ibid.*, p. 176.
[12] *Ibid.*, p. 184.

A further very important aspect of Rousseau's method of instruction is the use he proposed to make of the pupil's natural curiosity to lead him to the intellectual aspects of education. He reminded his readers that bodily activity is stimulated by restlessness, the desire to find release for physical energies. In the same way, he wrote, mental activity is motivated by *curiosity,* "and this curiosity, rightly directed, is the motive force of the age with which we are dealing." [13] Curiosity, therefore, is the natural instinct which he believed would impel Émile to study, without external pressures, those things which have a direct and immediate bearing upon his life. To illustrate, Rousseau called attention to the distinction between the things people learn in order to impress others and the things they learn because they have a direct and immediate contribution to make in everyday life. Let us suppose, he said, that a scientist is left on an island with nothing to keep him company other than his books and scientific equipment. He has no human companionship and knows that he must spend the rest of his life there without any hope of escape. Now, Rousseau asked, would such a man be interested in continuing his scientific study? Obviously not. But he would not rest until he had explored every corner of his island. The urge to explore the island would arise from his natural curiosity. The knowledge acquired thereby would be of direct use to him. Scientific study, on the other hand, would not produce knowledge useful in this same way. Nor would scientific knowledge have value as a social achievement inasmuch as there would be no one before whom the stranded scientist could display it. It is natural curiosity, therefore, which must be utilized in the education of Émile if he is to distinguish between the useful and the useless. This understanding will have to be developed within "the island of mankind" which is the earth. "Our thoughts go no farther than our eyes and our understanding stretches only within the range that they have measured." [14]

Nor would Rousseau permit Émile to satisfy his curiosity by looking for answers in books. Reading halts thinking, he said, and the reading child learns words and not knowledge. Therefore, Émile is to have no book but the world and no teaching but that provided by the world about him. If necessary, his curiosity may be aroused by taking him on excursions to the woods and fields or by pointing out to him aspects of his environment which may have escaped his notice heretofore. If he fails to become curious and raise questions about his surroundings, the tutor should put questions to him. But Émile's questions should not be satisfied too quickly. Let him worry about them for a while, for Rousseau said he was not trying to teach Émile science but rather how to discover it for himself. Although Rousseau

[13] *Ibid.,* p. 178.
[14] *Ibid.,* pp. 178–179.

admitted that his pupil must ultimately move from sense data to the formulation of statements of principles, the transitions must not be attempted too quickly lest errors creep in. The senses should be the only guides for the first tasks undertaken by reason.

As an example, Rousseau cited the study of geography. He urged that on one of their pleasure hikes Émile should be taken by his tutor to a nearby hill early in the morning. While standing on the hill, Émile should be asked to mark the rising of the sun. He should be told to select a landmark to record the precise point on the horizon at which the sun first appears. Within a day or two, the tutor should take him to the same place to observe the setting of the sun. This operation should be repeated several times without comment until, out of curiosity, the boy asks how the sun gets from the west where it sets at night to the east where it rises in the morning. The tutor must not answer this question but must let Émile ponder it. If after due time he seems to be making no progress, the tutor may ask him to explain how the sun gets from the east to the west during the daylight hours. With this single clue, the answer should be apparent to Émile without much further delay.

Rousseau described how the same methods of instruction are to be employed in other scientific studies, including astronomy, map making, and physics. In each case, Émile is to be shielded from the ready-made answers found in books and the misleading confusion provided by scientific instruments. Such dangers should be avoided by having Émile make his own equipment. Not only will this give him firsthand knowledge about the questions in his mind but it will also develop his powers of observation and build bodily strength and skills. His first balance may be a pole, and he may use the back of a chair as a fulcrum. "Thus, my little physicist is ready to rectify a balance before ever he sees one." Furthermore, by depending upon his own sense data and by forming his own conclusions, his reason will be kept free from authority, and he will also develop greater ingenuity in discovering relationships, connecting ideas, and inventing apparatus.[15]

Rousseau said that the period from twelve to fifteen is also the time when Émile should be trained to prolong his attention span, not by compulsion or authority but merely by appeals to his interest and desires. With the awakening of the powers of the intellect through maturation, Émile will begin to recognize the difference between work and play. He will know that work includes those activities engaged in to serve some necessity or end. On the other hand, he will come to realize that play consists of those activities engaged in for amusement or relaxation. In work the attention is to be held by an object for as long as it serves a specific use or satisfies a particular want. Thus, work which consists of activities engaged in for a

[15] *Ibid.*, p. 191.

particular reason understood and accepted by the pupil will be especially useful in expanding his attention span.

The tutor must be careful, however, not to attempt to teach moral principles. The question still is not: Is it good? but is rather: Is it useful? Interest must still be centered primarily on things and not ideas. Émile is not yet ready to recognize the good except in so far as things are good for him, that is, useful in serving his own purposes. By focusing attention upon the useful, he will acquire the ability to see the relationships between things and their uses. This is the basis of common sense, but if you furnish him with "useless tools which he may never require, you deprive him of man's most useful tool—common sense." [16]

Rousseau said that as Émile begins to make judgments about the usefulness of things he is laying the foundation for reason. At this point, Rousseau warned against allowing inadequate standards of value to appear. He illustrated his point by referring to Émile's pride when, as a result of his earlier studies of magnetism, he thought that he had solved the secret of a trick he had seen at a carnival in which the magician used a wax duck with a magnet hidden inside. Rousseau described how the tutor then arranged to have Émile's vanity hurt by letting him be embarrassed in public. He had the magician invite Émile to show in public how the trick was done, but, unknown to Émile, the magician had changed the trick so that the duck would not behave for Émile. Everyone laughed at him, and thereafter he was not so sure of himself nor so anxious to show off his knowledge.

Because Rousseau was interested in having Émile learn to look upon knowledge as something to be used and not something to be displayed, he cautioned against letting Émile compete with others in matters of knowledge or in physical strength. Rather, Émile should be shown what progress he himself makes from year to year. For example, he should be shown the weight he lifted, by using all his strength, last year. Then he should be allowed to see if he can lift the same weight, or a heavier one now. Also, he should be shown the course he ran last year without tiring. Then he should see whether he can do the same this year. Today, we speak of this type of motivation as competing with oneself.

Finally, the period from twelve to fifteen was said to be the time during which the first principles of social organization are to be established. Again, Émile is not to be taught these ideas directly, but they are to be developed from experience. This, too, is the time when the first textbook is to be placed in Émile's hands. The book Rousseau chose for this purpose was *Robinson Crusoe*. He believed that Émile would be fascinated by the story and motivated to imitate his newly discovered hero. He should be given every encouragement. He should make garments like those worn by Crusoe

[16] *Ibid.*, p. 193.

while on the island. He should gather together the equipment and materials needed for an expedition into a similarly isolated and solitary land. Here, Rousseau said, is a real opportunity for Émile to test the true worth of things, of trades, and of people. Émile should engage in those activities by which Crusoe supported himself on the island. Thus he will find that he must be skilled in all manners of arts and trades. He will clearly recognize the true worth of agriculture, of the metal trades, and of carpentry and will understand the usefulness of these occupations as contrasted with the work of the artist, the musician, and the silversmith, who make things that have only an artificial value.

Here, too, is the proper basis to help Émile learn the advantage to be gained when each man engages in that trade for which he is best fitted by nature and inclination. Émile will see that society arises from the need to exchange goods and services. He will recognize the social value of each craft and trade. Similarly, he will see that standard units of measure must be established and used if the exchange of goods and services is to be carried on peacefully and with justice to all. He will find that money has no real usefulness in itself but is merely the medium of exchange by which the products of the various trades and crafts may be distributed equitably and with greater ease. Similarly, he will come to look on social customs and laws in their true light, namely, as formal agreements which set forth the conditions under which communication and commerce can be carried on.

From this type of direct experience, Émile will also learn that wealth is in reality the result of the greater productivity which is made possible by the division of labor. Wealth is therefore the fruit of social organization and should be regarded as the true property not of the individual but of society. Thus, if Émile is to enjoy the benefits to be had from the various social arrangements, he must pay his debt to society. To pay his debt to society, Émile will need to learn a trade. He should be encouraged to do so, for not only will the trade enable him to pay his social debt but also it will give him a feeling of equality with and respect for all the other useful members of society. At the same time, it will provide him with a means for making a living in the event that he should later suffer economic or political reverses.

Rousseau said that if Émile is equipped with a trade he will never need to be subservient or beholden to anyone. Trained to judge true worth, he will not be misled by artificial social distinctions or false standards of values. He will dominate and command no one. Nor will he accept the judgment and authority of another. We might say that these are rather extraordinary achievements for a lad of fifteen, but Rousseau seemingly did not regard them as such.

After Fifteen

Rousseau was confident that any youth reared as Émile was reared during the first fifteen years of his life will have a kind and affectionate disposition. He will have learned to look to others for help only in times of need and to be sympathetic with those who need help. The question now arises how this good nature may be preserved as Émile enters the more tempestuous years of adolescence.

Rousseau noted that at this age a youth educated in the conventional manner would be introduced to adult society. He would be invited to the festivities at court and to other elaborate social events. When such a youth entered the luxurious palaces and mixed with the expensively dressed guests, he would compare his own raiment with that displayed by his new associates. Thus, he would become envious of those who were able to surpass him and vain in the presence of those who did not measure up to his own standards. It is in this manner, said Rousseau, that the seeds of pride, vanity, greed, and envy are sown and the arrogant and brutal natures common among the men and women of high station are developed.

To avoid these evils, Rousseau urged that Émile be kept from court life and the poisonous charms of high society until his nature had attained greater maturity. He believed that it would be better to have Émile continue to live in the country, where his emerging passions might develop in simpler surroundings. As his powers of imagination begin to unfold, Émile will tend to put himself in the place of the individuals with whom he comes in contact in his simple rural environment. Now he will suffer in the sufferings of others, and the first feelings of tenderness ever to touch his heart will be experienced. This feeling of kinship and the resulting desire to render some assistance will arise from the fact that he will imagine himself the victim of similar misfortunes. This, Rousseau said, is evidence of the emergence of the self-love with which Émile was endowed by the Creator. It is the first of the passions to emerge. Now the primary concern for self-preservation will induce him to want to eliminate the danger that has overcome one of his fellow creatures because he sees it as a threat to himself.

As soon as the passion of self-love has emerged, Rousseau instructed that Émile should be taken to the hospital, the jail, and even the gallows, where he would see at first hand some of the misfortunes to which man is heir. In selecting the type of cases to show him, the tutor should be guided by the following three maxims. First, we sympathize not with those who are happier than we but with those who are more miserable.[17] Second, we pity in others only those faults which we think might also be found in

[17] *Ibid.*, p. 252.

ourselves.[18] Hence, Émile must be made to recognize that the misfortunes he sees in the case of others may also be visited upon him. Care must be taken to show him that the beggar he meets may once have been a wealthy merchant and that the miserable creature in the hospital who is undergoing the most excruciating pain was not so many months ago a gay favorite at court. Third, the degree of pity that is aroused in us is determined not so much by the type of evil that has befallen the victim as by the degree to which he is sensitive to his affliction and, therefore, the degree or extent of his suffering.[19] Since young people are generally sensitive to the weeping and crying of others and measure the extent of the sufferers' injuries by these visible signs, it is better to let Émile witness at the outset cases of open suffering rather than afflicted persons who may be much more deeply injured but who bear their pain more stoically. Émile, though a member of the elite class, should be led to see the suffering of the poor. He should be allowed to see that they suffer even more than the rich because they have not the means to buy assistance. By associating with them, Émile will learn that men are just as sensitive in one class as in another and that, since it is the common people who suffer most, it is they who merit his greatest concern. It is in this manner, Rousseau said, that Émile will come to identify himself with all mankind and not merely with a single class, presumably his own.

Rousseau's concluding word of advice before he turned once again to the intellectual development of his pupil was addressed to those teachers who think that the adolescent is by nature a difficult and unruly individual. Do not complain of the energy and enthusiasm of this age, he admonished, but use it.[20] The excessive enthusiasm of the adolescent is an indication of his arousing passions. He is now capable of affection, and this presents a strong advantage to the teacher who will use it. So long as the pupil was incapable of affection, Rousseau reasoned, he was dependent on no one but himself. Now, however, he wants and needs others. By winning his affections, the teacher will not merely be using it as a pedagogical device but will also be forming the first ties that are to bind the young man to his species, his fellow men. At first, these ties will be limited to those with whom he has personal association. Later, the same feelings can be extended to include all of mankind.

Rousseau believed that the opportunity to provide moral training also comes with the pupil's awakening need for the affection and companionship of others. It was his opinion that morals and politics must be studied together,[21] and for this reason the study of history—that is to say, the story of men and their societies—provides the best basis for moral instruction

[18] *Ibid.*, p. 253.
[19] *Ibid.*, p. 254.
[20] *Ibid.*, p. 265.
[21] *Ibid.*, p. 269.

This departure from his earlier insistence that everything must be studied by direct observation comes as something of a surprise. But, Rousseau said, the new approach is necessary because it would be dangerous at this age to have Émile study customs and morality at first hand. To bring him into direct contact with the wickedness of contemporary men would expose him to the grave danger of falling into their corrupt practices himself. Furthermore, in the study of history Émile will be able to read the heart of man without philosophy. He will be able to study men as a spectator, without passion or prejudice; ". . . he will view them as their judge, not as their accomplice or as their accuser." [22]

Rousseau did not think all historians were equally useful for his purposes. Some of them, he said, spent too much time in interpreting events. Rousseau believed that much of written history is essentially the product of the author's imagination and, therefore, presents a greatly distorted picture. Rousseau would have his pupil be given the facts only and then be allowed to form his own opinions. It is only in this way that he will learn to know mankind in true perspective. As long as he is guided by the historian's opinion, he will see only with another's eyes, "and when those eyes are no longer at his disposal he can see nothing." [23]

In Rousseau's opinion, a youth brought up like Émile, hence innocent of the faults and viciousness of those about whom he is now reading, will become thoroughly ashamed of his own species as he becomes acquainted with the record. He will detect the evil and corruption which motivated the acts of men and will resolve not to yield to similar motives. Here again, Rousseau indicated that he expected moral ideas to grow out of experience, but now Émile has access to vicarious experiences as well as his own. Reading history, therefore, will become for Émile a course in practical philosophy. His natural disposition to do good and the value system implanted in his soul, which by now will have been brought to a high level of development by the preceding years of education, will lead him to make judgments of right and wrong. The important point for Rousseau is that these judgments will be determined by *natural* standards and not by artificial, man-made convention.

But the development of moral principles through the study of history was not thought by Rousseau to be enough to guarantee that Émile will grow up to be a good man. Rousseau believed that men become good only by doing good. Therefore, he would have Émile engage in works of charity. By this he meant not merely that Émile should give alms, necessary as such giving might be, but more specifically that he should render personal service in helping the unfortunate. He should do so not as a knight errant riding forth with a great show so that others may observe and praise him

[22] *Ibid.*, p. 271.
[23] *Ibid.*, p. 274.

but by working quietly at whatever he knows to be good and useful. Since he will, by nature, dislike noise, quarreling, oppression, and physical abuse, he will intervene whenever conflict and suffering are brought to his attention. His method of giving aid will always be appropriate to his age. At this point Rousseau wrote, "I never tire repeating: put all the lessons of young people in actions rather than in words; let them learn nothing in books about which experience can teach them." [24]

The present limitations of space do not permit us to continue in full this review of the intellectual and moral development Rousseau proposed for his hypothetical pupil. It must suffice for us to note that, by employing the principles of education already made clear in this and earlier stages, Rousseau proposed to have the tutor assist Émile in developing from firsthand as well as from vicarious experiences the generalizations and moral principles which his pupil would require in all areas of life, including religion and sex. He also described how the tutor introduces Émile to society at the age of twenty and then supervises, with a touch of slyness, the selection of a suitable mate for his pupil. The work of the tutor is to be completed only when at long last he has launched Émile upon the task of developing good taste. This is a task that will occupy the young man for many years and must be conducted for the greater part under his own direction. To this end, Émile must be encouraged to turn to literature, proceeding rather quickly from contemporary works to the literature of earlier times. Here again, Émile's native instincts are expected to lead him to recognize the superiority of the earlier works over the more recent ones—a superiority owing, in Rousseau's judgment, to the fact that the earlier writers were closer to the original state of nature than the contemporary writers.

In concluding his description, Rousseau cast a backward glance over the educational program he had described. He reaffirmed his complete confidence that a young man educated according to the principles he had recommended would be fully prepared to face the world. His physical strength and skills, his ability to observe accurately, his well-controlled passions, his intellectual powers, and his discriminating tastes would be fully developed. Completely under the direction of his own tastes and his own moral and intellectual principles—principles developed but not created by his education—he would not yield to social pressure nor adopt the evil customs and practices of those with whom he was now required to associate. He would be a quiet, dignified individual; he would not be arrogant, but he would consider himself the equal of anyone, regardless of station or social position. Furthermore, his words and deeds would always be in good taste and dictated by the highest moral principles. In brief, his natural instincts, brought to a high level of effectiveness by this education, would provide any

[24] *Ibid.*, p. 290.

Émile with the intellectual and moral guidance necessary to live the good life.

It is especially important for us to note once again that the intellectual and moral principles which in Rousseau's opinion would constitute Émile's knowledge of the good were not believed to have been transmitted to him by other men. Rather, they were said to be natural inclinations inherent in the soul from birth. They were brought to maturity and effectiveness, in Émile's case, through contacts with the things, the people, and finally the books that made up the carefully selected world in which Émile lived and grew to manhood. These principles were unfolded from within; they were not introduced from without. Émile's education merely provided the stimulation which caused the natural, inborn tendencies to unfold. In this connection we may quote Rousseau's original thesis: "Let us pose as an indisputable maxim that the first impulses of nature are always right; there is no original sin in the human heart; there is not found therein a single vice of which we cannot say how and why it entered." [25]

Influence on Modern Practice

As a theorist, Rousseau personally did very little to prove his theories in practice. He founded no educational institutions, nor did he establish a program of instruction for a flesh-and-blood Émile. He was no teacher and by his own admission did not consider himself fit to teach. On the other hand, his theories proved very provocative to others of a more practical turn of mind. The interest of such educators came to focus primarily on the role played by the senses in developing moral ideals and practical understanding. Adopting the philosophical ideas of Hobbes, Locke, and others in the scientific school, educators such as Pestalozzi, Froebel, Comenius, and Herbart developed versions of what is sometimes called *sense teaching*. We shall turn to the theories of the sense empiricists in Part III. It will be shown that the sense empiricists differed from Rousseau in that they hoped to develop knowledge of the good from the sense data themselves. In contrast to Rousseau's belief that moral ideas arise from within the soul, the later educators believed that such ideas are acquired from the outside.

Rousseau's educational theories had a second influence which, if widely known and understood, would win for him the everlasting gratitude of every child. He, perhaps more than any other person, helped to restore to children the joys and benefits of a happy, carefree childhood. Rousseau told us that in his day children were not so privileged. As stated earlier, among the higher social classes, children were generally separated from their parents shortly after they were born and were cared for by servants or in a foster

[25] *Ibid.*, p. 76.

home. Rousseau was influential in persuading mothers to devote themselves to their children, to nurse them, to care for them, and, above all, to fondle and play with them. He called attention to the fact that children are different from adults and must grow up before they can act, think, and feel like adults. He encouraged parents and teachers to study the way children grow so that appropriate care and activities can be provided at each stage of development. It was this interest in and concern for children as children that helped introduce child psychology, studies of child development, and the improvement of educational opportunities for all children.

Finally, Rousseau's insistence that nature must lead the way in education helped greatly in arousing indignation against the harsh brutality generally meted out when children failed to conform to arbitrarily imposed adult standards. Permissiveness began to replace compulsion. Freedom to grow, to live, and to make mistakes became a necessary condition for good education. True, the discipline and regimentation of a new type of highly standardized education soon came to dominate the educational scene in the nineteenth century; but when the forces of reform once again called for freedom, they turned to Rousseau for intellectual leadership. Although Dewey, Kilpatrick, and especially Bode were to protest loudly against this empty form of revolt, which cast out the existing system without substituting anything constructive in its place, the reform movement all too frequently gave evidence of acting as though it expected that children would grow into good men and women simply by following their native impulses without reference to the existing social environment.

While later educators have found much of value in the educational doctrines of Rousseau, the basic principle with which they take issue is his insistence that the individual receives directly from the hands of God a disposition to know and to do what is good. That is to say, knowledge of the good cannot be regarded by Rousseau's critics as something that emerges from within—at least not by a process of unfoldment or maturation.

STUDY AND DISCUSSION PROBLEMS RELATED TO PART II

1. Examine the sections "The Choice of a King" (page 210) and "The Divine Right of Kings" (page 391) which appear in George H. Sabine's *A History of Political Theory* to learn how the king came to be regarded as the agent through whom God makes known His will toward men.

Examine the section "The Papal Claims" (page 270) which appears in the same work to learn how the papal claims to be the agent of God on earth were established.

Examine the section "The Conciliar Theory" (page 308) in the same work to

learn how it was proposed that the responsibility of receiving and interpreting knowledge is a shared responsibility.

Can any one of these three positions be taken without denying the claim that the knowledge dispensed is of divine origin? If so, what are the important differences that distinguish the three views? Are the same differences apparent in political discussions throughout the world today?

2. Describe the scholarly activities carried on by the medieval monasteries (see Ellwood P. Cubberley's *Readings in the History of Education,* pages 76–83). To what extent could these activities be called "creative activities" or "scholarly research"? How many of the works mentioned by name had reference to affairs of this world?

3. Select any one of the Old Testament prophets and examine the account of his election as a prophet, the manner in which he was inspired, and the object of his particular mission. What role did the prophet *as a man* play in these matters?

4. Examine the administrative organization of three or four prominent national religious bodies to determine where the power to reach final decisions is located. What reasons are given for locating the power at that point? Now examine the catechism or the official statement of basic beliefs of these religious bodies. How does the instructional effort, as reflected by the catechism, encourage the acceptance of direction from the designated agency?

5. What similarities can you find between the "otherworldly" aspects of the religious reformers of the fifteenth and sixteenth centuries and of the literary romanticists of the nineteenth century? In what ways did the latter seem to be closer to the theories advanced by Rousseau?

6. What role did the "oversoul" play in Ralph Waldo Emerson's philosophical theories? How did this role influence his views on politics and education?

7. Examine the curriculum of any elementary parochial school which is available to you and compare it with that of the vernacular reading schools which flourished in Europe and America before 1750 (see Cubberley's *Readings in the History of Education*). In what important ways are they alike? In what ways are they different? How do you account for the similarities and differences?

8. Religious rites and ceremonies usually portray some episode in the early history of the sect which observes them. Make a list of such rites and ceremonies and describe the event which each commemorates. How do the observances of these holy days serve an educational function?

9. Project the probable changes that would be made in the curriculum and the individual courses of study of the existing public schools if they were to be taken over by one of the prominent national religious bodies. Help may be secured in this project by inquiring into the educational practices of schools maintained in modern states which have an official religion.

10. Develop a test for Part II by formulating a list of true statements (seventy-five or more) describing aspects of the social and educational beliefs and practices characteristic of each of the three methods by which it has been said men receive knowledge of the good. Arrange these statements in random order and ask members of the class to identify each statement by indicating the method for receiving knowledge with which it is most closely related.

Examples:

a. Education should include the study of foreign languages (the method of revelation).

b. Education should help pupils recall knowledge acquired before they were born into this life (the method of reminiscence).

c. Formal instruction in reading should be avoided until the pupil is at least twelve years old (the method of unfoldment).

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Part III

THE THEORY THAT KNOWLEDGE OF THE GOOD IS DISCOVERED

CHAPTER 11

BACKGROUNDS OF THE THEORY THAT KNOWLEDGE IS DISCOVERED

The philosophers encountered in our study of the theory that knowledge of the good is received taught that the source of all true knowledge lies beyond the reach of purely human effort. Thus each of the three systems of thought reviewed in the preceding section portrayed man as separated from the realm of the true, the good, and the beautiful by a gulf so great that only the supernatural was believed capable of crossing it. It was the necessity of bridging that gulf that had caused Plato to employ the theory of eternal souls. It was the same necessity that had caused the prophets to teach of divine revelation and Rousseau to expound the doctrine of special endowments. Not one of these philosophers thought it possible for man to reach into that other world at will and to draw from it any knowledge not already placed within his reach by a miracle. Thus, each said that were it not for the assistance of the supernatural mankind would have been doomed to walk in ignorance and error for all time. Even so the most man might do was to prepare himself by rites of purification or by education to receive and utilize the gifts of knowledge if and when a generous Providence should see fit to dispense them.

It has also been shown that each of the preceding philosophical schools warned about the danger of regarding as knowledge impressions originating in the temporal world, the everyday world of men and things. Their distrust of unaided reason as well as of the senses was inescapable because they had located the source of true knowledge outside the world of reason and sense. It followed inevitably that, since knowledge of the good cannot originate in the world of human activity, there is nothing for human reason and the physical senses to lay hold of but the not-good. Inevitably, therefore, knowledge of the good must *transcend* reason and the senses. It must somehow cross the abyss which separates man from the realm of true Being. This is

the leap which requires the assistance of the supernatural mentioned above. This is the assistance which is implied in one form or another in the term *transcendentalism* encountered so frequently in philosophical and theological discussions even today.

The Doctrine of Immanence

The philosophical antonym of *transcendent* is *immanent. Immanence* implies that the good is not separated from the world of sense and reason but is actually indwelling or inherent in it. Thus the doctrine of immanence would locate the search for knowledge of the good in the world about us and in ourselves. Our senses and our reason would thus be our friends instead of enemies bent on bringing us to ruin. And the world would be pictured as a friendly place, a place that is worth knowing and cultivating for our own good.

We may recall from a previous chapter that certain Greek philosophers who lived before the time of Plato had exhibited this kind of respect for the physical universe and had looked to it as the source of knowledge of the good. Among them we found the name of Democritus, who around 400 B.C. had suggested that there is no place to look for knowledge of the good life except in this world of matter and motion. Hippocrates, who had lived at approximately the same time, had learned to employ the methods of observation and reason so successfully in the field of medicine that his name still lives in the profession. Thucydides had made a good beginning in the development of a social science. And there had also been a group of teachers known as the Sophists, who had taught that the problems of men may be dealt with most effectively if rational methods are employed. They had earned the ridicule of Plato and others for offering to teach men how to use reason to attain personal advantage—a service for which they expected to be paid even though it was then customary to render this service without a fee.

In spite of the criticism of these views by Socrates and Plato, it was one of Plato's pupils, Aristotle, who contributed most directly to the advancement of the theory that knowledge of the good is discovered. It was he who did most to picture reason and the senses as respectable and necessary tools in discovering knowledge. We shall now proceed to examine those portions of his philosophy which have most directly affected the evolution of education. To do so, we must return once again to that period in the history of Athens which preceded the birth of Jesus of Nazareth by approximately 350 years.

Aristotle's Theory of Form

Unlike Plato, Aristotle came from a family of moderate circumstances and middle-class social status. His father had been a physician, and apparently a good one, for he had been called to be court physician to Amyntas of Macedonia, the father of Philip and the grandfather of Alexander the Great. Unhappily, Aristotle was not permitted to enjoy these more prosperous days very long, for he lost both parents while he was still a half-grown boy. Thereafter, he lived in the home of one of his father's friends. He was eighteen years old when he went to Athens to study under Plato at the Academy.

Perhaps as a result of these early experiences, Aristotle came to display a certain independence of mind and a tendency to entertain seriously the suggestions brought to consciousness by the senses. He could not follow Plato in the latter's rejection of the material universe as corrupting and corruptible. Whereas to Plato the material universe was merely the shadow of true Being, to Aristotle it was eternal and real. Aristotle granted that matter in its lowest form lacks purpose, as in the case of water, which will take the shape of any vessel into which it is poured. However, the same water may be given definite shape, as when it is frozen. Thereafter, it will retain its form except as it may be broken into smaller pieces by the use of force. The differences between *formless* water and *formed* water, or ice, are brought about by the addition of *form*.

Form and matter were, for Aristotle, the two basic ingredients of reality. On the one hand, there may be formless or unformed matter, such as air, water, dust, and flour. On the other hand, there may be pure form without matter. Between these extremes are the various mixtures and combinations of form and matter which account for the great variety of things and experiences we encounter in everyday life. It follows that objects of sense, such as this page, for example, are made up of both form and little particles of matter. Without form, the particles were merely a shapeless pile of sawdust. But when they were combined in the manufacturing process and given the form of a page, they took on the properties and attributes of the particular sheet of paper before me. Had they been combined with the form of a pencil, those same particles could have taken on, in company with some other matter, the size, color, shape, and writing potentialities of the pencil I hold in my hand.

In this sense, Aristotle's concept of pure form, or form without matter, is not too unlike the Platonic concept of idea-stuff. One basic difference resides in the fact that for Aristotle form is an integral part of every physical object we see with our eyes or hold in our hands. The form of pencil is in the

particular pencil with which I write, whereas for Plato the idea pencil would never be where it could be seen or touched. Thus, for Aristotle form may be said to be indwelling, or *immanent,* whereas for Plato ideas are *transcendent.*

Perhaps Aristotle's theory that traces of form are in the objects of the sensory world can be made clearer if we turn for a moment to Plotinus, who lived in the third Christian century. Plotinus was a mystic who made of the Platonic idea of the good the concept of One—absolute unity, indivisible, indestructible, unalterable, and uncreated—in other words, a being not too unlike the Hebraic-Christian concept of God. Furthermore, he said it was the nature of this One to be generous and outgoing. "It must spend itself, must pour from itself its essence till every possible form and degree of existence was actualized. Just, then, as light pours from the sun, so being emanates from the One." [1]

To Plotinus, the things of this universe, as well as the physical universe itself, were in reality bits or droplets of the essence of the One which became separated from the main body. He suggested that successive emanations resulted in the creation of divine reason, the world soul, the individual soul, the physical universe, and the human body. The One had no part in these creations and therefore could not be held accountable for any shortcomings or imperfections they later acquired. On the other hand, the several individual parts of creation were said to have been produced of the *essence* of the One, and for that reason they must bear some traces of the nature of their source.

It is this essence of the One present within each division and object of creation that accounts for the attributes of perfection we observe in the sensible world, such as order in the universe and the power of reason in man. Thus, if we were to agree with Plotinus about the origin of the physical universe, it would also be reasonable for us to begin our search for knowledge of the One by looking for the traces of the bits and pieces of its essence which are in each object that comes to our attention.

Discovering Knowledge

Returning to Aristotle, we may now discuss the concept that form is immanent by assuming that traces of form are present in everything we experience or learn to know through direct contact. We must realize, of course, that these traces of form are mixed in with a lot of matter which will cause us some difficulty. We shall have to learn to distinguish between the properties of the matter and the attributes of form, just as the processor

[1] B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. I, p. 287.

has learned to separate the gold he seeks from the worthless rubble which constitutes the bulk of gold-bearing ore. True, pure form may exist without matter, but ordinarily mortal man has no way of making direct contact with it, and his chances of gaining knowledge about it are much better if he begins by searching for knowledge of the traces which are in the bits and pieces.

Properly conducted and carried on long enough, such a search might in time lead us to discover a rather comprehensive amount of knowledge about pure form. In a general sense, this is what Aristotle attempted to do in his search for knowledge, a search which was in effect an effort to accumulate bits and pieces of knowledge until finally it was possible to fit them together to gain a concept of form in its final and complete state.

We should now make it clear that *form was for Aristotle the equivalent of the good.* To him, the search for knowledge of form and the search for knowledge of the good were the same. We can see this when we note that he believed that form gives purpose to matter. By this he meant that the idea or form of the hen, for example, accounts for the orderly manner in which the chemical elements in the egg combine to produce a chick. The chick, in turn, utilizes food, air, and water to become *actually* a hen, which a few months earlier it had been only *potentially.* Aristotle would have said that it was the potential hen that had brought into being the actual hen. It was the potential hen which had seen to it that the elements of egg, food, water, and air did not remain inert elements or did not combine to produce a duck or a crow.

In the same sense, the ideas constituting full and final knowledge were thought to exist potentially, that is, prior to the knowledge which a given individual may come to possess at a given time. The potential ideas actualize themselves in human reasoning just as the potential hen is actualized in the growing chick. In this sense, ideas may be said to think themselves into true knowledge through the process of reasoning. This statement presumably requires some clarification.

According to Aristotle, knowledge begins as in the case of a child, on the sensory level. The child sees the objects in its environment through the senses. The senses suck in, as it were, the gray of a weathered stone wall, the hardness of the stones, their roughness, and their coldness to the touch. These individual and haphazardly acquired sense data are then put together by a sixth sense, or *common sense,* which Aristotle located in the heart, into the meaning of the stone wall as a material thing.

At the same time, however, the child's intellect, as distinguished from his senses, intuits nonphysical qualities inherent in the wall. There is, for example, the concept of unity which arises from the fact that there are many stones but only one wall. Furthermore, there is the law of gravity which

is intuited, in naïve form, from the fact that the stones tend to stay in place when supported, but fall when the supports are taken away.

These intuitions Aristotle regarded as *analytical judgments,* and he believed that they provide for the intellect the data with which the reasoning process must deal. Unlike the physical senses, the intellect has no sixth or common sense which automatically integrates the data of analytical judgment. Therefore, the intellect must try through conscious effort to put the pieces together into their proper or inherent order. This process is called *synthesis.* It consists of trying one combination after another until suddenly the right combination becomes apparent. The process of searching for the right combination of the data gathered by the intellect as analytical judgments is also sometimes called *discursive* or *insightful reasoning.*[2] The moment of insight is the moment in which the potential idea is actualized and the individual becomes conscious of—that is, *discovers*—true knowledge in its final and complete form. The moments when full knowledge is ours, the moments of inspiration, last for only a few seconds. But though they are lost from consciousness when the mind turns to other things, Aristotle taught that the knowledge which was ours in the moment of inspiration can be "thought" again under the right conditions.

Clearly, according to Aristotle's views, it is through the efforts of the intellect that man discovers knowledge of the good. It was for Aristotle a discovery process, because he held that the flashes of insight are instances in which the human mind succeeds in looking upon pure form in its absolute and final state. The intellect does not *create* form, but *finds* it. The flashes of recognition occur not because ideas impress themselves upon an indifferent, or at least passive, mind (as in the theory of the philosophies of the received tradition); rather, they are the rewards of a painstaking, persistent search in which the human mind is the aggressor. True knowledge is potential while the search is under way. The potential truth serves to direct the reason's striving until the truth finally bursts into actuality in the moment of full recognition. The actual is potential throughout the search—and it *remains potential for every other searcher.* Thus it may be actualized again and again, but it will be the same truth which bursts into recognition in each actualization.

Aristotle's discovery process may be further illustrated as follows. Let us suppose that a Spartan and a Roman, each skilled in the processes of making analytical judgments and discursive reasoning, began independent studies to determine the best form of government. Neither knew of the other's study, and each proceeded in his own way. Each made analytical judgments about the several governments and social arrangements about which he was able to secure information in his time. When the analytical

[2] *Ibid.,* p. 145.

phase had progressed far enough, each tried to piece together his particular set of data. As each progressed in the discursive-reasoning stage, each attained the moment of insight quite independently of the other and from a different set of data. Yet the knowledge brought to actuality was the same for each. Thus, Aristotle might have said, both would have discovered that a monarchy was the best form of government. Identical discoveries would have resulted in these two instances because there was but one potential form of knowledge for each to actualize, even though it was actualized in two separate efforts. The results, so Aristotle taught, would have been the same regardless of when, where, or by whom the studies were conducted. The good is not many, but only one, and right thinking will lead without fail to identical knowledge.

Aristotle on Education

The importance Aristotle attached to the process by which knowledge is acquired led him to describe the process in some detail. We have five separate essays or lectures which he prepared on this subject. These have been gathered together to make up what we know as the *Organon,* which means "method" or "instrument." It was logical that he should make training in the use of the method of discovery the foremost purpose of education and that he should believe the good society to be controlled by those best able to use the method in discovering the goals for which men should strive. "No one will doubt," he wrote, "that the legislator should direct his attention above all to the education of youth, or that the neglect of education does harm to the states." Education is necessary not merely to train the leaders but also to mold the citizen to the government under which he lives. The better the form of government, the better it will work if there is a suitable and well-regulated educational program. A well-organized and smoothly operating state, in which each individual plays his proper role willingly and effectively, is what Aristotle believed education should strive to produce. "And since the whole [state] has one end, it is manifest that education should be one and the same for all, and that it should be public, and not private—not as at present, when everyone looks after his own children separately, and gives them separate instruction of the sort which he thinks best; the training in things which are of common interest should be the same for all." [3]

As to the nature and content of education, Aristotle noted that educational practices were divergent and conflicting in his day. There were those who urged that youth should be educated in the things useful in life; others

[3] *Politics,* VIII, i, 3–4, Benjamin Jowett (trans.), New York, Oxford University Press, 1908.

urged practice in moral virtue; still others made the higher knowledge the object of instruction. Aristotle clearly favored virtue as the central purpose and urged that a careful distinction be made in setting up the content of education between those pursuits that are liberal and those that are illiberal. His basis for making the distinction was that [4]

> any occupation, art, or science, which makes the body or soul or mind of the freeman less fit for the practice or exercise of virtue, is vulgar; wherefore we call those acts vulgar which tend to deform the body, and likewise all paid employments, for they absorb and degrade the mind. There are also some liberal arts quite proper for a freeman to acquire, but only in a certain degree, and if he attend to them too closely, in order to attain perfection in them, the same evil effects will follow. The object also which a man sets before him makes a great difference; if he does or learns anything for his own sake or for the sake of his friends, or with a view to excellence, the action will not appear illiberal; but if done for the sake of others, the very same action will be thought menial and servile.

It is from statements such as the above that a liberal education came to be identified by more recent disciples of Aristotle with studies that are undertaken neither for use nor profit but only for their own sake.

Aristotle did admit that certain subjects are necessary even though useful and for that reason must be included in the curriculum. Reading and writing were mentioned under this category. Gymnastics, music, and drawing, on the other hand, were thought desirable because they could be pursued for their own sake. Music especially seemed to him to be very worthwhile if properly pursued, as a leisure-time activity. Its proper pursuit, however, was not to be that of an idle amusement or pastime.

Beyond this, either Aristotle failed to develop fully his views on education or else his writings on the subject have not as yet been recovered. He did offer some comments on the rearing of children, much in the manner of a physician advising parents against improper foods and overprotection. The psychological benefits of imitative play in childhood were also noted. Concern for a proper background for the life of virtue led to statements warning of the dangers of allowing children to be exposed to indecencies or vulgarities of any sort. Children should not be allowed, by either the parents or the state, to see or hear anything incompatible with the highest virtues. To this end, they should not associate more than necessary with slaves or other menials. In fact, he gave voice to rather puritanical views when he discussed the state's obligations to protect the children from witnessing improper behavior or hearing vulgar songs and speech. His strong feelings on these matters seem to have had their source in his belief that a child will imitate whatever he sees or hears.

[4] *Ibid.*, VIII, ii, 4–6.

Education proper was divided by Aristotle into two periods. The earlier period, roughly from age seven to puberty, he hoped would be utilized to fix proper habits of conduct and taste. It was at this time that the method of imitation noted above was to be employed. The second period, ending at about age twenty-one, was to be employed in the development of virtue through the exercise of reason. It was here that the liberal studies noted earlier were to be utilized. His educational views seem to have been summarized in the following words: "It is evident, then, that there is a sort of education in which parents should train their sons, not as being useful or necessary, but because it is liberal or noble. Whether this is of one kind only, or of more than one, and if so, what they are, and how they are to be imparted, must hereafter be determined." [5] Though he pursued this subject for a few more pages, his answers to these questions were never determined to our knowledge in a comprehensive and systematic manner.

The effect of Aristotle's friendly attitude toward the physical universe, which Plato and his followers had denounced, has been a substantial one. Three direct consequences of that attitude merit mention at this time.

Alexandrian Science

A rather large body of well-organized and carefully developed scientific knowledge was produced by his own efforts and the efforts of research centers, such as the one at Alexandria, which were founded as a result of Aristotle's influence. In this connection, it will be recalled that the reasoning process, and hence the method for discovering knowledge of the good, was said by Aristotle to begin in analytical judgments intuited directly from the world about us. The accumulation of these data and their classification according to natural categories therefore represented important and primary steps in the intellectual process as he understood it. Accordingly, he personally made extensive observations, organized the resulting data, and published his discoveries. A substantial segment of his works which have come down to us consists of this type of material. So thoroughly did he do his work that he is credited with having laid the foundations of a number of the modern sciences.

Equally important was his influence in inspiring others to engage in similar work. Among his pupils was Alexander, the son of King Philip of Macedonia, who later came to be known as Alexander the Great. Although the good will that existed between tutor and pupil did not continue long after Alexander rose to power, the fruits of that relationship were bountiful, indeed. There is evidence that Alexander encouraged scientific study in its many branches. When he thought of building a suitable memorial to him-

[5] *Ibid.*, VIII, iii, 10.

self, he founded a great cultural city at the mouth of the Nile to which he gave his name. There he established three great institutions, which exerted strong influence in intellectual circles for several centuries. These institutions were the museum, the library, and the university. The last was not so much a teaching institution as a research center. From this city and from other centers where similar studies were encouraged, there emerged a substantial body of scientific knowledge designated as the *Alexandrian sciences.* So thorough and systematic were the Alexandrian scholars that their work laid the foundations for many of the branches which today constitute the bulk of the scientific studies pursued in secondary and higher institutions of learning. It was the recovery of the Aristotelian-Alexandrian heritage which redirected the efforts of post-Renaissance intellectual leaders, notably Bacon and Newton, into scientific channels. This later development will be followed in some detail in subsequent chapters.

Nature Is Good

Great as was Aristotle's contribution to the development of science and scientific studies, as illustrated by the achievements at Alexandria, he may have exerted an even more significant influence by representing the natural universe as basically a good universe. This is the second major consequence of his work referred to above. The theory that natural law is good law became especially prominent in Stoicism, the leading school of philosophical thought among the Romans during the best days of the empire. Brinton suggests that this concept may have been responsible for two innovations in colonial policy introduced with phenomenal success by the Romans.[6] The first innovation was the distinction the Romans learned to draw between the law as it is *stated* and the law as it is *intended* to be or as it ought to be. The Romans believed that true justice might be realized only as the intended meaning of the law became known. The second Roman innovation made it possible to extend the Roman law to cover those who came into the empire but who had not been born Romans. This seems to have been a substantial advance in political theory and may have been responsible for a large measure of the success enjoyed by the empire builders.

Obviously, the Roman view of the law as what was intended rather than as what was written was in sharp contrast to the views of those who looked upon the written law as a sacred thing, a divine commandment given in its final form in revelation. Those who held the latter view made no distinction between the law as stated and the law as it ought to be. But Paul, who lived during one of the better periods of the empire, reflected the Roman

[6] Crane Brinton, *Ideas and Men,* Englewood Cliffs, N.J., Prentice-Hall, Inc., pp. 126–133.

view when he noted the difference between the letter and the spirit of the law. Armed with this distinction, Brinton says, the Roman judge was likely to believe that in some instances justice could not be done unless he got around the letter of the law to a reasonable interpretation of its intent. Thus the intent of the law came to be the real, the right, meaning of the law. True justice came to be regarded as an attribute of the *natural law,* or even of the will of God. Obviously, the Roman judge who looked for what was just was forced to find out what a given law intended in a given case. This required the judge to use a discovery process.

The Romans were also able to think of natural law as applying to all people and not merely to Romans alone. The Athenians had looked upon their laws as the special possessions of the citizenry. Captives and others who came to live in the geographical limits of their domain remained outside the law. There was no easy way to make them citizens, and hence they remained outsiders generation after generation—a potential and sometimes actual fifth column inside the city. Jewish law was also regarded as the special property of the Jews only. It was not intended for non-Jews. But the Romans overcame this difficulty in their empire by extending the rights of citizenship to the inhabitants of the lands they annexed. Thus Roman law was made to apply to them, too, and they became integral parts of the empire.

The extension of Roman law to peoples who had not been born Romans and had followed their own laws and customs for many generations often led to confusion and conflict. Local law and custom frequently did not agree with the laws and customs of other parts of the empire or with the Roman law itself. Now it became necessary for the judges to resolve the difficulties, a process which came to consist of discovering the intent of the conflicting statutes. The experienced jurist, in all probability, began his work on a particular case by inquiring into the origins of the laws in conflict. He would ask the older inhabitants of the localities involved about the circumstances which had led to the enactment of the laws and their interpretation in earlier cases. From these particulars, he would proceed to other data in the expectation that as the inquiry progressed the underlying principle of equity would be discovered. It was expected that the natural justice believed to underlie both laws would be good for both contestants and that the basic principle so discovered would be recognized by all parties to the dispute.

Brinton states that it was in some such manner that the law of the people, *jus gentium,* evolved. This body of laws became in time *jus naturale,* something higher even than *jus civile,* the Roman law proper. Thus *jus naturale,* the natural law, came to be regarded not as something which was made by the hand of man but as something which had a higher origin. The higher, natural law was to be learned not by revelation but by a rational process, clearly a process of discovery.

The Good Is Reasonable

The third consequence of Aristotle's considerable influence upon the Western world lay in the conviction of medieval scholars that the good was reasonable. There was no doubt in Aristotle's mind about the basic reasonableness of pure form, or about the manifestation of that reasonableness in the sensible universe. This he believed to be so because matter was said to acquire purpose when it is combined with form. It is form, therefore, which gives purpose and order to the material universe; and that universe may be said to be built on and operated in accord with a reasonable, integrated, and fully consistent universal or cosmic plan. Hence, it would follow logically that there is a reason—presumably a good reason—behind everything we see or otherwise experience.

We shall soon see that the friendly regard for nature and natural law entertained by Aristotle and the Roman jurists was lost to Europe for many centuries. During this time, dependence on revealed knowledge was the prevailing intellectual attitude. Later, as the otherworldly emphasis maintained by the church fathers subsided and Aristotelian philosophy began to work its way back into the capitals of Christendom, the natural universe once again began to be accepted as a place friendly to man. Later, those of a religious bent found it logical to identify the author of the cosmic plan as none other than the Creator. The natural universe, according to that line of thinking, came to be looked upon as the handiwork of God. Its operation was now said to be in accord with principles or laws laid down by God. It followed in the minds of the later Aristotelian philosophers that God's will, at least as far as natural man and the natural universe are concerned, can be discovered in the plan and laws of nature and that knowledge so discovered is more useful, more understandable, and more certain than knowledge claimed to have been revealed. As will be seen later, this belief led to the conflict between reason and faith which has continued among some intellectuals, especially theologians, to this day.

By the twelfth Christian century, then, enough of the Aristotelian system of thought had been recovered in western Europe to cause certain groups of scholars to turn away from the previous exclusive and overwhelming dependence upon revelation for knowledge of the good and to adopt the methods of discovery. These few individuals, mostly members of the clergy, came to adopt a more tolerant attitude toward the natural universe and the things of nature. To them, the natural universe appeared as the handiwork of a reasonable Creator. That reasonableness was said to be apparent in the regularity of the seasons and in the movements of the planets. Everything the Creator made and everything He willed was now said to

be endowed with the attributes of God's intelligence and reasonableness. Thus, the good was again held to be immanent, and knowledge of it discoverable.

It is evident from the preceding discussion that Aristotle believed that knowledge of the good may be acquired only when we employ a method of discovery. As we shall see in the following chapters, those who followed him in this belief came to hold different theories as to which method of discovery is most productive and dependable. Some turned to reason and others to science. The influence of these new ways in Western philosophy has been a substantial one, and it is to those methods, as well as to the systems of education which followed from them, that we must now turn our attention.

CHAPTER 12

THE METHOD OF REASON

Those who have accepted Aristotle's leadership in philosophical matters have also been inclined to employ a process of discovery in their search for knowledge of the good. They have had to begin their philosophical adventures with the following basic assumptions. First, this is an orderly and purposeful universe by virtue of the indwelling form or divinely conceived cosmic plan. Second, the intellect intuits reliable bits of information about that cosmic design and purpose. Third, by fitting together the several pieces that have already been intuited, and retained for just this purpose by memory, man is able from time to time to infer something about the blank spaces that still remain in his general pattern of knowledge. In this way, man is able to fill in, as it were, important bits of information about the basic design and thus to extend the frontiers of his knowledge through discovery.

Aristotle was convinced that the filling-in process was a legitimate and dependable way to discover new knowledge. He recognized that it involved substantial risk but felt that the potential rewards by way of a better understanding of the true nature and purpose of the universe—hence, of the proper ordering of men's lives with reference to it—warranted taking the necessary chances.

The method of discovering new knowledge by examining and rearranging old knowledge is basically a *rational* process. We saw that Aristotle was so impressed by the promise of the rational method of discovery that he devoted much effort to defining its nature and to working out safeguards for its proper use. His studies along these lines were conducted with infinite care, and the results of his efforts appear in the five books of the *Organon,* to which reference has already been made in the preceding chapter.

Discovery by Deduction

It was obvious to Aristotle, as it must be to us, that if we are to discover new knowledge by examining old knowledge we must make certain that the statements or *premises* with which the discovery process is to begin are suitable ones. There is a possibility that not every statement which we have come to accept as true is necessarily so. Nor is every form in which a truth may be expressed equally appropriate for use in the reasoning process. The initial steps, therefore, must be those by which we make sure that we begin with valid propositions. These matters were dealt with by Aristotle in the first two books of the *Organon.*

In the third book, the *Analytica Priora,* Aristotle came to grips with the problem of how to arrange the propositions in such ways that we may come out with new knowledge. His inquiry produced the *syllogism,* which Aristotle defined as [1]

> discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so. I mean by the last phrase that they produce the consequence, and by this, that no further term is required from without in order to make the consequence necessary.

Obviously, the consequence, the "something other" that follows from the original statements given, was regarded by Aristotle to be just as true as the original statements. The new truth is *derived* from the initial statements by a form of deduction. This kind of reasoning is therefore known as *deductive reasoning.*

To Aristotle, deductive reasoning was a method of discovery equally valid in science and in philosophy. The same rules were said to apply in either field, although, of course, the initial premises would of necessity be those which are typical of the special field in which the inquiry is being conducted.[2] But we must not overlook the fact that before the deductive method can be used it is first necessary to have some valid premises or established truths with which to begin.

Discovery by Induction

So absorbed was Aristotle in identifying and defining the processes of deductive reasoning that he did not face the question of how we are to acquire the initial premises, or *principia,* of the syllogism until he came to the end of the fourth book of the *Organon*—namely, the *Analytica Poste-*

[1] *Analytica Priora,* I, 24^b, 20, A. J. Jenkinson (trans.), in *The Works of Aristotle,* New York, Oxford University Press, 1928.

[2] George Grote, *Aristotle,* London, John Murray, 1872, vol. I, p. 233.

riora. At that point, he indicated a fundamental disagreement with Plato, for he made it clear that the knowledge on which the initial statements are based is not in us at birth. Rather, it is acquired. We are able to acquire it because we are by nature endowed with (1) the powers of sense perception, (2) memory, or the power to retain impressions derived from sense perceptions, and (3) an intellect capable of inferring the nature of the universal truths from their particular representations in the objects immediately observed by us. Thus he taught that we are able to acquire knowledge of the true nature of things from the particular specimens we encounter. That is to say, we can learn the true nature of man, for example, from the particular men who have come within the circle of our acquaintance. In Aristotle's words:[3]

> . . . these states of knowledge are neither innate [as Plato believed them to be] in a determinate form, nor developed from other higher states of knowledge, but from sense-perception. It is like a rout in battle stopped by first one man making a stand and then another, until the original formation has been restored. The soul is so constituted as to be capable of this process.
>
> Let us now restate the account given already, though with insufficient clearness. When one of a number of logically indiscriminable particulars has made a stand, the earliest universal is present in the soul: for though the act of sense-perception is of the particular, its content is universal—is man, for example, not the man Callias. A fresh stand is made among these rudimentary universals, and the process does not cease until the indivisible concepts, the true universals, are established. . . .
>
> Thus it is clear that we must get to know the primary premises by induction; for the method by which even sense-perception implants the universal is inductive.

True knowledge, Aristotle here seemed to be saying, consists of the universals. The universals are established by induction and were, for Aristotle, knowledge of the indwelling form, indwelling or immanent in the material universe. They are, for us, concepts or statements descriptive of particular aspects of form. As such, they are the patterns which Aristotle believed artisans should follow if they were to improve their products. They are the standards by which we judge the particulars in their class. Thus, the universal man must be the good man, the yardstick by which to judge the excellence of Henry or James or Bill; and at the same time the universal man must be the model by which each must seek to improve himself. In brief, we find the good in the universal, and, as Aristotle has shown, our knowledge of the universal is acquired inductively, a process of discovery that he believed to be essentially a rational process.

[3] *Analytica Posteriora,* II, 19, 100ª, 10–100ᵇ, 5, G. R. G. Mure, (trans.), in *The Works of Aristotle,* New York, Oxford University Press, 1928.

When the above account is viewed in its entirety, it becomes apparent that Aristotle believed two different types of rational procedures to be involved in the complete process of discovering knowledge, the one an inductive process and the other a deductive process. He also believed that the discovery process as a whole must begin with knowledge acquired inductively from the sense perceptions. Only after universal truths have been established inductively, by moving from the particular to the universal, did he think it becomes appropriate or even possible to employ the deductive method as in the syllogism. This order and the resulting dependence of the deductive upon the prior inductive process may seem very evident to *us,* but for a number of reasons they have not been equally apparent to all men at all times. Thereon hinges much of the history of intellectual thought in the West, as we soon shall see.

Faith Vanquished Reason

Before turning to the part played by the rise of Christianity in causing the influence of Aristotle to decline in western Europe, we should remind ourselves again that his descriptions of the discovery process are contained in the five books which later scholars combined into a single work called the *Organon.* Whether or not Aristotle so intended, these scholars arranged the five books in such a way that the first three emphasize the deductive process, and it is not until the end of the fourth book that the inductive movement is considered. Even then, it is given but a fraction of the space used to develop the deductive method. Although Aristotle's other extant works were, for the most part, the product of his use of the inductive method in conducting scientific studies, it happened that many of them, together with the inductive portion of the *Organon,* were not generally known in western Europe after their suppression by Christian authorities.

The circumstances which led to the suppression of these works merit our attention at this time. It is known that Aristotle's influence in the Mediterranean world during the first Christian century was a substantial one. The flourishing Alexandrian learning and the popularity of the philosophy of Stoicism among the leading families of Rome gave evidence of this fact. Both movements encouraged a basically friendly attitude toward nature and the physical universe.

The rise of Christianity, however, turned the minds of men away from the study of nature and of the existing social arrangements with a view to their improvement. Many of the early Christian leaders soon came to identify nature and sense perceptions with sin and evil. Discovery as a method of acquiring knowledge of the good became suspect. The issue between faith and reason became sharply drawn. In due time, those who

joined with the Christians were called upon to reject knowledge derived from this-worldly sources and to live by knowledge revealed in Christian prophecy. Christianity demanded faith in the Christian revelation, and as the movement spread to include persons in high places, even emperors, the books of pagan authors first were prohibited to the Christian clergy and then were ordered destroyed by an overly zealous emperor.

It was in this manner that the works of Aristotle, along with those of many of the Alexandrian scholars, were lost to the Christian world. Plato, though scarcely known by name, lived on in Christian theology through the efforts of learned converts, such as Clement and Origen. It was the outright rejection of the methods of discovery, as well as the burning of the books which contained the products of scientific scholarship, that brought on the period known in the history of the Western world as the Dark Ages. This period extended roughly from A.D. 500 to 1000. Though the efforts of extremists to eradicate rational methods were countered by a few moderates, including Augustine, it was not until the church began to establish schools in the manner described in Chapter 8 and communities of schoolmen appeared in the cathedral and collegiate centers that reason once again came to challenge revelation as the method for acquiring knowledge of the good. The resurgence of reason to important heights in the twelfth and thirteenth centuries was due in large measure to the fact that at that time portions of the Aristotelian logic, as well as his science, were being recovered from the Moors in southern Spain.

Aristotle Returns to Christian Europe

The Moors were people of Arabic culture who had pushed into Spain around A.D. 700. Their ancestors had come by their knowledge of Greek science and philosophy from the Nestorian Christians, who had been driven from the Roman Empire for heresy during the fifth century. The Nestorians had fled to Persia, where they translated many of the Greek classics into Syriac. Successive waves of emigrants brought additional works, and, in due time, the number of translations became quite substantial. In the seventh century, Persia came under the domination of the Mohammedans. Fortunately, some of the caliphs became interested in the Greek learning and took constructive steps to obtain and translate into Arabic many of the better-known works. In some instances, the Arabic translations are the nearest approaches to the original Greek versions we have been able to recover.

The Arabians were a vigorous and restless people. They spread in many directions, carrying elements of the Greek learning with them. In the seventh century, one such movement carried them westward across northern

Africa, where they converted the Berber tribesmen to Mohammedanism. It was from this African outpost that the invasion of the Spanish peninsula by men of the Mohammedan religion was launched. For a time it looked as if the invaders, known as the Moors, would conquer much that remained of the Roman Empire. The tide was finally turned at Tours in A.D. 732 by the Franks under the leadership of Charles Martel, and thereafter the invaders were successfully contained in the southern part of Spain. Here they set up an independent caliphate with Cordova as its chief city. This and other major centers of population soon became outposts of Arabic culture. Universities were founded in which at least some of the works derived from the Greeks were known and studied. Libraries of books were gathered together such as western Europe had not known for centuries. It is said, for example, that in the tenth century Hakam II had in his library at Cordova no less than 600,000 volumes. Four hundred years later, the royal library of France is said to have had only 900 volumes.[4] From this bridgehead in Spain the once banned and still suspect culture of the pagan Greeks began to seep slowly northward into Christian Europe.

The first rumblings of the victorious return of Aristotle to the Christian world were heard in the medieval disputes over the nature of universals. On one side of this historic debate were the *realists,*[5] who, following Plato, insisted that the universal, as for example, the idea bed discussed earlier, exists independently of, and in a higher, more real form than, any particular bed in which one may sleep. To them, the highest, most perfect, most authoritative instance of "bed-ness" was identified with the idea or universal bed. Hence, they said, it is always the universal bed and never a particular bed to which man must look in his search for knowledge of the good bed. Thus is indicated something of the importance the classical realists attached to the search for universals while studiously ignoring the world of particulars.

The *nominalists,* on the other hand, insisted, as had Martianus Cappella,[6] that the universal, as in the case of the bed, is merely a name, or *nomen,* for all the particular beds man has known. The class name thus enables man to think about and to speak of all of the individual beds as a group. But the group name is nothing more than a general term which merely refers to the particular characteristics the individual members of the group happen to possess in common. In any event, the nominalists said, the class

[4] F. Sherwood Taylor, *The March of Mind,* New York, The Macmillan Company, 1939, pp. 77–78.

[5] Remember that the meaning of *realism* underwent a revolutionary change when it came to be used in modern Europe, especially by the scientists.

[6] Frederick Eby and Charles Flinn Arrowood, *History and Philosophy of Education, Ancient and Medieval,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1940. p 742.

name is not derived from, nor does it imply the existence of, an independent, self-sustaining idea bed.

On closer inspection, the position of the nominalists immediately suggests a certain relationship with Aristotle's famous dictum, "No Form without matter, no matter without Form." Also, as with Aristotle, it implies that man must search for knowledge of the real nature and purpose of a given class of beings by studying the particular individuals of which the class consists. This is essentially a discovering process, a process reminiscent of the inductive method described and used by Aristotle.

At various times prior to the twelfth century, the conflict between the classical realists and the nominalists became quite bitter. Involved in the conflict were many matters of religious and social doctrine, including the definition of the nature and powers of the church itself. If, as the realists claimed, the church is the embodiment of the universal, the idea church, it is something apart from and above the particular individuals who hold membership in it and who carry on its work. This view makes quite logical the further claim that the doctrines of the church have a higher status than the opinions or beliefs of individual members. In the case of differences, the individual, therefore, can quite logically be required to acquiesce to the demands of religious authority. The same line of reasoning would apply with equal logic in the case of the state, a trade union, or any other institution in which the individual has membership. The authority of the institution, the realists held, is of a higher order and, therefore, always takes precedence over the rights or wishes of the individual.

However, if the nominalists' view is taken—namely, that the church or any other institution is merely the name used to designate all the individuals who happen to be united together in a common association—then all claims in behalf of institutional authority over the rights of the individual lose some of their logical basis. The realists' position emphasized faith—faith in the authority of the institution to dispense knowledge of the good. The nominalists' position tended to lean toward an appeal to reason; and reason was pictured as a dependable way to acquire knowledge which is *accessible to every right-thinking individual.*

Historians tell us that as the Dark Ages wore on the religious leaders came to insist more and more upon the ways of faith. One after another renounced pagan learning and abandoned even the few ancient authors whose works had survived the bonfires of Rome. As A.D. 1000 approached, the report that Jesus would return in that year to judge the quick and the dead and that He would bring an end to this miserable little world gained wide circulation:[7]

[7] William Henry Hudson, *The Story of the Renaissance,* New York, Henry Holt and Company, Inc., 1926, pp. 9–16.

A wave of religious frenzy swept over Europe. Throngs of pilgrims flocked from all parts to the great shrines of Christendom, some to reach their destination, some to perish on the way, some to be crushed to death in the immense crowds which gathered at the entrances of the sacred spots. Here and there, as a congregation knelt in silence before the elevated Host, an army of Flagellants would march along the streets, lashing their naked bodies with knotted cords dripping with their blood, and with hoarse voices repeating their monotonous cry: "Dies irae! Dies irae! the end of the world is at hand!"

This was scarcely an atmosphere which encouraged a considerable interest in the common, everyday affairs of this world. Quite to the contrary, belief in the authority of the church gained the upper hand, and reason bowed before the overwhelming forces that urged unswerving faith in revelation.

Scholasticism

Great movements expressive of emotional excesses have a way of invoking extremes in the opposite direction, and it was thus in eleventh-century Europe. Men who had been emotionally prepared to expect the end of the world were not able to turn lightly to the prosaic affairs of everyday life when the predicted doom did not materialize. Great crusades were launched. Men traveled and came in touch with new ideas and new ways. The Moslems, both in the East and in southern Spain, were found to have surprisingly advanced cultures. More than one "soldier of the cross," bent on driving the infidels from the places holy to Christendom, stayed on to study under Moslem masters.

In Paris, the realist-nominalist debates broke out anew, spearheaded by Anselm and Roscellinus, respectively. The disputes were joined by the students of these men, and by their successors. Among these were Abélard, Albertus Magnus, and others, some of whom sought a middle ground between the two extreme positions. Had it not been for the soothing hand of Thomas Aquinas, in the thirteenth century, the mounting bitterness with which the several antagonists waged their battle might have brought about a great schism in Christendom long before such a break did occur in the Protestant Reformation several centuries later.

Prior to the twelfth century, the intellectual fervor in Paris flourished without benefit of Aristotelian logic save for a few fragments of the *Organon*. The atmosphere was one in which attention was focused on the interplay of abstract ideas. There was little in this situation to induce efforts to develop new truths from direct observations or personal experiences. Thus when much of Aristotle was recovered from the Arabic sources, especially those in southern Spain, it was the deductive rather than the inductive method of thought that gained a hearty welcome.

Fig. 42. "God Willeth It." Thus was the first crusade announced.

The prediction that the world would end in A.D. 1000 had enjoyed the status of revealed knowledge and had been supported by members of the clergy just as were other matters of faith. Thus, when the prediction failed to come true, there were some who became suspicious of other portions of doctrine taught by the clergy of that day. This tendency to question, stimulated by the introduction of new methods of rational inquiry from the Moslem world, led a group of intellectuals in Paris to submit the prevailing religious teachings to critical examination. Starting with Abélard, we find a succession of teachers at the Cathedral of Notre Dame and the Collegiate Church of Saint Geneviève who set themselves to examining the prevailing theology, point by point, in a systematic attempt to root out error and to demonstrate new truth if such could be found. Abélard is said to have examined more than 150 separate propositions. His method was essentially one of gathering all the arguments he could find supporting a given point of view. Against this list he would then set forth all the arguments for the contrary view. The decision would then be given in favor of the stronger list. It must be noted, however, that he gathered the reasons for or against a given position not from observation or direct experience but primarily from *authority,* that is, from knowledge which had been given in revelation or established in some other manner.

This method of beginning the dialectical process with propositions or premises which are themselves taken for granted and are not subject to question, and of deriving from them conclusions which also are held to be true on the basis of logical necessity, is the deductive method of reasoning. It became the schoolmen's method of inquiry and is known in the history of philosophy and education as the "schoolmen's dialectic," or *scholasticism.* Since it was used so extensively by the schoolmen of the twelfth and thirteenth centuries, these centuries are frequently referred to as the age of scholasticism. The constructive phase of the scholastic movement reached its high point with Thomas Aquinas in the thirteenth century. From him the modern Roman Catholic Church has derived its Thomistic theology, and it is his system of philosophy which still figures largely in the education of the Catholic clergy today.

Theology Turns to Reason

Unlike the earlier members of the scholastic movement, Aquinas seems to have been acquainted with the inductive as well as the deductive methods of reasoning as they had been developed by Aristotle. He incorporated aspects of each in his own method of philosophical inquiry. Like Aristotle, he believed in the basic reasonableness of the universe, which he attributed to the reasonableness of the Creator. Furthermore, since man is made in the image

of God, reason was held to be an attribute of man also. Human reasoning as a method of discovering knowledge of the good therefore is not contrary to God's plan for man but is an important aspect of that plan. He concluded that all thinking *rightly done* not only will confirm revealed truth but also will enable man to discover new truth and especially to learn how such truth is to be employed in everyday affairs.

There was for Aquinas no conflict between faith and reason. To him, all truth given in revelation must of necessity be reasonable. True, certain knowledge so given cannot be reasoned by finite man, but this was taken to be evidence of the limitations of the human mind and not of the knowledge revealed. Such truths must therefore be treated as *mysteries,* which are reasonable in their basic nature but, for the present at least, are beyond the limits of merely human understanding. The mysteries, then, are the areas of knowledge within which we are dependent on the methods of revelation and faith. The mysteries are not subject to question.

It follows that whenever a line of thinking or a sequence of logical steps leads man to a conclusion which is in agreement with authority, the conclusion may be regarded as newly discovered truth. But when such deductions are found to be contrary to authority established in revelation, it must be concluded that the thinking has been at fault. Reason is always subordinate to authority and must give way in cases of conflict. An eighteenth-century rationalist might have said that the use of authority to guide and control the reasoning process is like the use some misguided teachers and pupils make of the answers sometimes included in arithmetic books—the calculations are made to fit the answers even in cases of typographical errors.

The Twofold Truth

Like Albertus Magnus, his teacher, Thomas Aquinas made a sharp distinction between what man may learn to know by rational methods and what he must accept on faith. The former, he said, constitutes the area of philosophy and natural theology; the latter is the area reserved to sacred theology. In philosophy and natural theology, reason may roam widely and inquire freely—always, of course, within the limits set by authority established in sacred theology. So long as man is inquiring into the nature and true purpose of things, it is quite proper to begin even with sense perceptions and from these establish universal concepts indicative of the plan of God. The universals were believed to be discoverable because they were looked upon as the thoughts God had in mind when He created the universe. As God's thoughts—the ideas which guided His hands in the creation process, so to speak—they are "immanent in the universe and are inseparable therefore from the particular objects that embody and enact them." The human

mind was believed to be of such a nature that it can pick out of the particular instances those qualities which the particulars share in common. The abstractions from the particulars may then enter the thinking process as ideas without reference to the particular conditions under which they have been encountered. Thus, one can think about trees without having to deal with each oak, pine, palm, and fig tree from which the concept or general idea of trees was derived. "As concepts of the mind they are no more separable from the intellect, which entertains them, than they are, as forms of material things, from the things which materialize them. . . . The forms . . . are at once God's ideas, the formal structure of the sensible world, and concepts formed by and forming the human intellect. But they are not *merely* any one of these." [8] Save for the assumption that concepts are the thoughts of God, Aquinas' views are obviously very much like Aristotle's on the same subject.

But Aquinas, we repeat, did not believe mere man capable of discovering and understanding God's thoughts in all aspects. There was, in his opinion, an area of knowledge which human reason is incapable of penetrating. This is the area which we may know only through revelation. To him, revealed truth is a higher form of truth, and to it reason must bow when the two come in conflict. But by starting with propositions which enjoy the status of authority, either because they have been revealed or because they have been established rationally, reason may spin out "a neat and consistent pattern of propositions." Rightly carried out, Aquinas and the scholastics in general believed this process would yield reliable approximations of what God has in mind for mankind; that is, it would lead to the discovery of knowledge of the good. Men need only make sure that none of the propositions with which they begin, or which they spin, are contrary to the body of truth given to the Christian as matters to be accepted on faith. Deductive reasoning thus still retained the upper hand in scholastic theology.

Scholasticism, for all its adherence to knowledge given in revelation, nevertheless awakened a spirit of inquiry and an enthusiasm for discovery that had far-reaching effects. Under the vigorous application of the scholastic dialectic, the vast body of religious beliefs inherited from the Dark Ages was revised under the critical eye of Thomistic logic. Schools sprang up where none had existed before, and many existing centers of instruction began to grow into the bustling universities of modern times. New truth was established, not on authority—at least not exclusively—but on the processes of rational inquiry and logical necessity. Rigorous training in the *ways of reason* became the central feature of the educative process and had important consequences, as we shall see in the next chapter.

Of equal importance was the new respect for nature and the physical man

[8] B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. I, p. 383.

which came to replace the extreme otherworldliness that had characterized the intellectual outlook of the previous era. This world is the garden which God has created for our use, said Thomas Aquinas, and we should learn to use it and enjoy it. His methods of inquiry, as distinguished from his use of faith, were especially adaptable to this end.

In due time, the wedge Albertus Magnus and Thomas Aquinas inserted between philosophy and theology came to be driven deeper. Thus, in the fourteenth century, William of Ockham called upon philosophy to concern itself only "with the observable and with inferences rigorously drawn from and confined to the observable." He thereby came close to confining philosophical inquiry to limits within which the modern scientist might be willing to work. Furthermore, he urged philosophy to purge itself of the tendency to explain the difficult by calling in the supernatural. He stated that *essences are not to be multiplied except as may be necessary*. This is the famous "Ockham's razor" with which he slashed at the propositions spun out by the scholastics and other philosophers of his day.

Especially significant for later developments was Ockham's insistence that each observable event or effect has its equally observable cause. If this is so, philosophy should be able to discover the principles which govern this physical universe by identifying the causal relationships and inferring the governing principles from them. But on matters nonphysical, philosophy was still held to be unable to probe effectively, and Ockham insisted that the philosophical attitude (as distinguished from the theological) in these things must be one of skepticism. For example, philosophy cannot establish the nature of God or determine right from wrong. These were for Ockham, as they had been for Tertullian before him, matters which must be accepted on faith. Ockham's statement, "I believe because it is impossible," in which he echoed Tertullian, gives evidence of what was for him the twofold nature of knowledge.

But the separation of philosophy from theology proved to be a stimulus to further intellectual activity. The division made it possible for men of curiosity and vigor to probe deeply into the nature of things and institutions without seeming to attack too directly the foundations of theological orthodoxy. The theory that there is a secular truth which is learned by rational processes and a divine truth which is acquired only in revelation was called the *doctrine of the twofold truth*. One might then be a rationalist—that is to say, one might depend on reason—in matters involving the things of this world, and be a man of faith—and depend on revealed knowledge—in matters spiritual. Since two utterly different ways of acquiring knowledge were said to prevail in the two realms, knowledge derived in one was believed not to be in fundamental conflict with what was held to be true in the other.

Armed with a secular status and hence freed to some degree from the danger of being charged with heresy, philosophers now intensified the effort with which they had pressed the recovery of the ancient learning. We described in some detail in Chapter 7 how the Renaissance stimulated certain scholars to turn to the original sources of Scripture in their efforts to correct theological errors. Their search led them to rediscover the superior culture of ancient Greece and Rome. Knowledge of that culture stimulated men of secular interests to search even more vigorously, and the movement to recover the ancient learning which developed is known as *humanism*. Greek works on science and literature were now sought by the humanists with the zeal of treasure hunters. Greek grammar and literature were given places in the schools along with the traditional Latin studies. Secular works began to replace the books on theology which had constituted the major body of subject matter in the curricula of the cathedral schools. The scientific works of Aristotle became especially prized, as were books on the mathematical studies which had been recommended by Plato.

In this atmosphere of respect for the ancient writers, it was perhaps inevitable that the Greek disposition to inquire freely into all things could not long be repressed. In due time, the intellectual kettle started boiling very vigorously, and it is small wonder that a few curious souls like Bruno and Galileo who peered more eagerly than the rest and who proposed rather startling conclusions from what they saw, were singled out for persecution by the defenders of the old faith in revelation. In due time the philosophical world came to realize that Aristotle, the great intellectual model held high by the scholastics, had said that the premises of deductive reason are to be established by induction. This realization was as a fuel added to the fire, and the intellectual stew which had been brewing for several centuries could no longer be contained in the traditional vessels.

Rationalism

Francis Bacon is generally given credit for setting modern philosophy on its inductive course. He went further than had William of Ockham and the scholastics in separating philosophy from theology. He flatly refused even to discuss the latter. This concentration upon the development of philosophy as distinguished from theology and the inclusion within its sphere of interest everything that is capable of being known by rational methods ultimately left very little over which the theologians were given the last word. The almost complete dependence upon inductive reason as the method for acquiring knowledge ultimately produced the intellectual movement known as *rationalism*.

Bacon was convinced that mankind had suffered too long under the

weight of superstition and false beliefs. He concluded that the pursuit of knowledge by which life might be improved had been gravely handicapped by the habit of accepting initial premises without question. Philosophy, he said, had been made the slave of authority, the authority both of religious faith and of Aristotle's scientific teachings. He said that as long as reason is required to begin with authority it can never free itself from the consequences of the errors which may inhere in the initial premises themselves. Nor can it break outside the limits set by those premises. To be free, reason must begin by ridding itself of the false premises—which Bacon called idols or false gods. No propositions may be accepted which cannot be or have not been shown to be true, he said. This is what modern investigators might call "verifying the data." In modern science data so verified would be called *objective data,* that is, facts that are known to be true because prejudice and opinion have been eliminated and the data themselves have been verified by several individuals, each of whom worked independently of the others. Starting with a body of facts established in this manner, Bacon believed man might discover a better system of knowledge by proceeding *inductively.*

Bacon saw quite clearly that the inductive method he proposed was somewhat different from that outlined by Aristotle in the *Organon.* He therefore focused considerable effort upon developing his method and ultimately published a description of it under the title *Novum Organum,* or *The New Method.* In this form, the new method of inquiry ultimately contributed greatly to the development of modern science. Its influence in giving direction to the scientific movement, and to scientific education as well, will be noted in later chapters.

Our present interest in the work of Francis Bacon lies in the influence he had upon the evolution of rationalism as a philosophical movement. As such, it is distinct from the scientific movement, which also was given important assistance by his method of inquiry. As a philosophical movement, rationalism [9]

> challenged faith in revelation, only to oppose to it faith in the power of unaided reason to reach and grasp the truth. . . . Bacon, Hobbes, Descartes, Spinoza, and Leibnitz were all certain that the Real was constructed according to mathematical and logical principles, and that the human mind, by strict adhesion to the scientific method and obedience to the laws of mathematics and logic, could reason out its nature. The objections that they urged against the Scholastics and the ancients were *rational* objections, and their defense of their own systems was a *rational* defense.

Faith in the power of unaided reason to discover truth was nowhere more in evidence than in the case of René Descartes. By employing what

[9] *Ibid.,* vol. II, p. 141.

he believed to be purely rational methods, he was led to describe the natural universe in surprisingly mechanistic terms. But even more surprising was his invasion, with his method of inductive reasoning, of the area which the scholastics and even Bacon had reserved to theology and the methods of faith. A devout Catholic, Descartes nonetheless claimed that religious doctrine, including belief in God and in the immortal soul, can and must be demonstrated rationally. In fact, he said, this is the only way nonbelievers can be won to Christianity, for if they were able to accept these things on faith, they would already be converts.

It will be seen at once that this is hardly an area into which a scientist would be likely to venture. Descartes entered it not as a scientist but as a logician and mathematician. So convinced was he that the mathematical type of logic would lead one to know the truth about the universe, and even about God, that he spent considerable time using and perfecting the inductive methods of mathematical reasoning. As a result of his original work in developing mathematical processes, he is credited with having originated important parts of analytical geometry.

The mathematical type of inductive reasoning was further developed by Spinoza and Leibnitz. In fact, the latter developed a system of calculus. Like Descartes, each constructed his own philosophical system by employing purely rational processes. Each began, as had Descartes, by isolating propositions which on inspection alone the mind was said to grasp as true and as self-evident. These self-evident truths are what the rationalists call *first principles*. They are generally established by *analysis*. A case in point is the manner in which Descartes examined and discarded all philosophical propositions until he arrived at his famous "I think, therefore I am." He made this his first principle because he could find no logical justification for doubting it. The axioms of mathematics, such as "equals added to equals produce equals" and "a straight line is the shortest distance between two points," are other examples.

From his list of first principles discovered by analysis, the rationalist believed he could progress inductively and by strictly logical steps to generalizations of the highest order. This is the process of *synthesis,* and, save for the points of departure, it is similar to the inductive process described by Aristotle as the way to establish knowledge of universals. The rationalist came to believe, even as Aristotle had taught, that the human mind, by employing the right rules, can think its way to discovering the innermost secrets of the universe. Religious rationalists, that is to say, rationalists who continued to believe in God, came to hold that right thinking would enable man to think the very thoughts of God. Thoughts developed inductively from first principles were held to be much more nearly true than generalizations based upon either sensory data or authority. Right thinking, it was said, would lead man inevitably to discover knowledge of the good.

The Good Society

It should be obvious that the rationalists, like the scholastics, put great emphasis on teaching right thinking in their schools. The next chapter will show how instruction in logic came to dominate the curriculum. In time, the concern for teaching youth *how* to think came to overshadow even the traditional religious preoccupation with teaching *what* to think.

Another logical and early consequence of turning to methods of discovery in the search for knowledge of the good was the air of hopefulness it generated among the people of Europe. Pessimism about the worthwhileness of making the effort to bring about social improvements now gave way to a spirit of hope. Men began to believe in progress and to expect to make improvements. They became confident that efforts properly expended would lead to the discovery of ways to bring about a better life on earth. The spirit of change came in, and the steady march to the world of modern times was under way.

As men turned to the methods of reason rather than of faith, the political and economic influence of the clergy and the entrenched nobility began to diminish. The ability to discover knowledge by rational processes soon came to be claimed by commoners and especially by men of secular callings. Social and political status was no longer regarded as evidence of intellectual superiority. Any man might now venture into the world of philosophical speculation, and some of the conclusions of the newcomers soon came to challenge long-standing beliefs and customs. Evidence of this trend may be found in the theological reconstruction achieved by the scholastics and is even more apparent in the social theories advanced by the rationalists.

By the eighteenth century, faith in the powers of unaided reason became the dominant intellectual note. In fact, that century is referred to variously as the Age of Reason and as the Enlightenment. This was the period when men hoped to rid themselves of the weight of false knowledge and superstition by the diligent employment of inductive reason. Social, political, and economic injustice was to be eliminated by following the rules of right thinking. The literature of that day presents us with numerous utopian schemes, each proposed as a purely theoretical system. The fact that they were *theories* was not held against them. In fact, it may have worked in their favor, for it was generally believed that theory, properly formulated, would inevitably point man to good practice. Not a few of the utopian dreams found their way into America. We remember some of the experiments by the names New Harmony, the Oneida Community, and even the famous Brook Farm. Not until bitter disappointment followed from a too easy acceptance of the theoretical did it occur to men that reason operating on a purely theoretical level may not always be adequate to lead us to knowledge of the good.

CHAPTER 13

LEARNING TO REASON

In Chapter 8 an effort was made to describe the types of educational procedures and kinds of schools developed by those who wished to live according to knowledge given in revelation. Judaism, Mohammedanism, and Christianity were listed as great religious movements which were founded upon knowledge said to have been received in this manner. Each became a major religious movement because it employed a program of education to propagate the basic body of beliefs upon which the movement was founded. The educational practices employed by each were designed to transmit those beliefs and to foster an abiding faith in them.

It was also indicated that as the Christian Church became the dominant social institution in Europe the science and literature developed in pagan Athens, Alexandria, and Rome were neglected and finally lost to Europeans. The schools which had flourished in the major centers of population even during the first Christian centuries also withered from lack of interest and were finally abandoned. In their place, the Christians introduced somewhat loosely organized classes to instruct converts in their beliefs. These were the catechumenal classes designed to nurture faith and to turn the converts away from dwelling on the cares and concerns of this life and toward making preparations for a life to come. For Christians who were preparing for service in the church, a more advanced type of instruction was available in the catechetical classes. Since early Christian doctrine was to be accepted on faith, there was thought to be little need for literary skills or worldly knowledge, and the early Christian congregations accordingly exerted very little effort to develop a literate membership. Consequently, the ability to read had all but disappeared by A.D. 800 even among the clergy and the nobility. The three centuries from A.D. 500 to 800 constitute the darkest of the period

known as the Dark Ages, which is generally said to have ended shortly after A.D. 1000.

We noted in Chapter 8 that as the ninth century began Charlemagne, the grandson of Charles Martel, who had led the Franks in their successful stand against the invading Moors, was recognized by the Pope as the head of the "Holy" Roman Empire. Though almost, if not entirely, illiterate himself, Charlemagne had somehow acquired a deep respect for learning. He was led thereby to take steps to halt the deterioration taking place in the Empire as a result of the widespread ignorance and superstition by building a system of schools. We recall that, as his first step, he called Alcuin, a monk trained in Ireland, to set up a palace school for the benefit of his family and friends. Next, he ordered the bishops to take steps to ensure that the clergy could read. To help them, he established Alcuin in the most strategic ecclesiastical office available for this purpose. With this strong encouragement from the top, various councils of churchmen became aware of the need for a more thoroughgoing educational effort and took steps to meet the need.

One such council, meeting in Rome in A.D. 826, called upon all bishops to appoint teachers of the liberal arts and theology. Apparently this order caused some confusion about whether distinctly new schools or classes were to be set up or whether the designated instruction should be given in the already existing catechumenal and catechetical classes. Another council, also meeting in Rome a few years later made it clear that the specified instruction should be given in schools connected with the cathedrals. Furthermore, these schools should be regarded as a distinctive type of school and presumably were to be of a more advanced nature than the classes which taught the elements of religion. The council also ordered that classes of the existing catechumenal and catechetical types should be maintained in every parish.[1]

Subsequent councils reaffirmed and nurtured the growing interest in learning. The new schools which were established in connection with the cathedrals and therefore came to be known as *cathedral schools* soon offered the most favorable atmosphere then available within which to conduct scholarly pursuits. It was natural, therefore, that men with intellectual interests began, in time, to congregate in these centers and that the beginnings of a new intellectual movement came to be formed there, where circumstances were favorable to intellectual advancement and development.

[1] Frederick Eby and Charles Flinn Arrowood, *The History and Philosophy of Education, Ancient and Medieval,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1940, p. 709.

Scholastic Education

By the eleventh century, then, the church already had a rather clearly defined organization to serve its educational needs, with the activities of greatest importance to it concentrated in the principal centers of learning. The bishop, then as now, was the administrative head of all ecclesiastical affairs in his diocese. His church was known as the *cathedral,* and he administered the affairs of his diocese from this center. Most of the priests under his supervision were assigned to serve the various parishes. However, there was need for an additional, and sometimes a rather substantial, number of clergymen attached to the cathedral staff to assist in the administrative work of the diocese. These clerics, as distinguished from the parish priests, were generally organized into a *chapter,* which was presided over by a *dean*. One of the members of the chapter was usually assigned to supervise the instructional activities centered at the cathedral and was known as the *scholasticus* or, as in England, the *chancellor*.

Occasionally, there were churches of considerable size, though not cathedrals, to which a substantial number of priests were assigned. These came to be known as *collegiate churches* because the staff formed a *college* of canons as distinguished from the chapter of canons located at the cathedrals. Some of the collegiate churches also began to provide instruction beyond the elementary classes in religion ordered for every parish, and sometimes the higher classes offered instruction that compared favorably with that offered by the cathedral schools. In case a student received his initial instruction at one of the lesser centers and wished to prepare for service in the church, it was desirable for him to take additional work at one of the major centers. Thus, there developed a tendency on the part of the scholars to move from one center to another in order to secure the highest level of instruction available.

It appears that in the lesser collegiate and cathedral schools the list of subjects studied may have consisted of little more than the elements of Latin grammar, some Latin literature under the name of *rhetoric,* and some elements of logic or dialectic. These three subjects, grammar, rhetoric, and dialectic, constituted the famous *trivium,* which we noted in Chapter 8. In some of the better schools it appears that additional fragmentary instruction may have been offered in arithmetic, geometry, astronomy, and music, the four traditional subjects known among the scholars as the *quadrivium*. It will be recalled that these were the four subjects described by Plato as training to be taken preparatory to the study of dialectic. It was natural that as the medieval scholars came to learn more about the ancient writers they, too, began to look upon dialectic as the most advanced of all the academic

subjects. Dialectical studies came to enjoy an especially favorable place in the eleventh and subsequent centuries, when Christian theologians were hard put to counter the philosophical inroads being made by scholars who had fallen under the influence of Arabic culture.

Perhaps as a consequence of the geographical factors which contributed to the development of Paris as a capital city, as well as her location in relation to the Moslem colony in southern Spain, the scholars gathered together at the collegiate and cathedral centers in and around that city became involved in disputes on matters of religious belief. At the beginning of the eleventh century there appeared in Paris a teacher who proved so popular as a lecturer on theology that many students from other centers of learning came to hear him. It is generally agreed that the work of this man, Abélard, whom we identified in the preceding chapter as a leading figure in the scholastic movement, contributed substantially to the formation in Paris of a general body of students who had completed the studies provided at the lesser collegiate and cathedral centers. It was out of this body of advanced students that the institution which became the University of Paris was formed.

But this embryonic university was more than a collection of students and masters. We have seen that in earlier days Christian education had been undertaken to teach the scholars to believe the doctrines of the church without critical examination. Learning had been regarded essentially as an act of faith, and any doubts entertained by a reluctant scholar had been looked upon as evidence that the devil still had influence over him. The devout Christian had been not a man of reason but a man of strong faith. "I believe because it is impossible," Tertullion had said—as did William of Ockham considerably later—and the churchman of the medieval period would have agreed wholeheartedly with both. Both believed that the good life was to be had only by complete submission to the ways of faith.

In contrast to this resolute and unquestioning acceptance of the official teachings of the ecclesiastical authorities, Abélard and his intellectually restless colleagues in Paris now began to employ techniques of critical inquiry. It has already been suggested that because of increased travel and numerous contacts with the Arab world the men gathered at Paris were better informed than their predecessors. Thus, some aspects of religious beliefs prevalent in their day appeared to them to be unreasonable. Abélard became convinced that if the church continued to press for the blind acceptance of such teachings more harm than good would result. He therefore ventured to correct error wherever he thought he detected it. His method of inquiry was essentially a rational one. "Through doubt we are led to inquire, and through inquiry we discover truth," he wrote, and in his studies and lectures he examined matters of belief one by one. His procedure, as we stated

earlier, was to analyze a given item of doctrine by presenting all the reasons for as well as all those against it, with the final decision going to the side which had the better case. This was clearly a method for discovering knowledge and not one of blind acceptance. The fact that his lectures on theology were so well received indicates that even in the twelfth century there was a substantial segment of the clergy ready to turn from a complete dependence upon the ways of faith and revelation to the ways of reason and discovery.

The ways of discovering knowledge by the use of reason are neither haphazard nor directed by impulse. The gathering of the pertinent evidence must be carried on in an orderly fashion if the conclusions drawn from such evidence are to be acceptable. The need for a systematic procedure was recognized by Abélard, and his preferred method, that of marshaling the evidence on both sides of the question preliminary to drawing the conclusion, attracted attention from all sides.

But Abélard and other intellectuals of his day were not yet ready to look anywhere and everywhere for possible relevant evidence. They were content to restrict their search for data to the writings of the church fathers and the body of other literature held sacred by the Christian Church. The facts gathered from these sources were not submitted to critical examination but were accepted on the authority of the source itself. Reason, therefore, was made to begin with authority in the manner of the deductive method of thought previously discussed. Some historians are inclined to believe that Abélard apparently was not acquainted with the *Analytica Posteriora*. If this is the case, he had no background that would have inclined him toward induction either from sense data or from first principles. In any event, his insistence upon grounding the discovery process on authority became the dominant characteristic of the intellectual activity that was developing in Paris.

The great interest in theological inquiries stimulated by Abélard was maintained for several generations. The habit of presenting arguments both for and against a particular issue, or *thesis,* led to endless disputation. Furthermore, it was the clergy gathered around the collegiate and cathedral centers who were directly involved, and especially those who were assigned to school matters. Hence, the movement became labeled as *scholasticism*. The aspects of that movement which are of primary interest to us were described in the preceding chapter.

Rise of the Modern University

The appearance in Paris of a large number of advanced scholars interested in improving their backgrounds in theology has already been men-

tioned. In addition to the renowned Abélard, there were other *masters* who engaged in public lectures, and from this group was ultimately organized a *faculty of theology*. With the organization of the faculty of theology, the privilege of lecturing was restricted to the legitimate or approved masters; and it was entirely logical that the church, concerned as it was about orthodoxy, should incline toward restricting attendance at the theological disputations to those who could engage in them or hear them without endangering their faith. Therefore, attendance at the lectures on theology came to be restricted to advanced students, that is, to those who had already been schooled as members of the clergy and whose faith it was assumed had already been securely established.

Here, then, was a restricted circle within which the philosophical inquiries might be conducted in comparative safety, and only those properly prepared to engage in them were permitted to give lectures. The adoption of these twin regulations regarding eligibility to teach and to attend was an important step in the growth of the embryonic university.

The preoccupation with theological matters which was so evident at Paris was not shared in all the other cities where similar groups of advanced scholars were congregating. In twelfth-century Bologna, for example, there was great interest in the dispute between the papacy and the local sovereigns about which had jurisdiction over the surrounding lands. Inquiries into the legal bases of the conflicting claims had led Irnerius to study law. Inasmuch as the Romans had been outstandingly successful as civil administrators and had introduced their code of law throughout Europe, it was logical that that code should become the object of his investigations. It was largely through Irnerius' work that interest was reawakened in law as a means of restoring order in the temporal affairs of men. As a result, a *faculty of law* was organized at Bologna to carry on the work he had started. This faculty resembled in many respects the faculty of theology which arose at Paris.

It will also be recalled that in the period between the decline of the Roman Empire and the rise of the modern states the church had stepped in to provide some measure of order and stability. Thus it was necessary for the ecclesiastical authorities to make laws from time to time. Over a period of several centuries the variety of such decrees had become a mass of legislation lacking consistency and leading to endless confusion. The renewed interest in legal studies generated at Bologna now led Gratian to undertake the task of revising the ecclesiastical decrees and organizing them into a consistent, unified system. Under his influence, the study of *canon law* became a recognized branch of inquiry distinct from the study of *civil law*. In Bologna, as in Paris, the method of study was that of the scholastics, deductive reasoning.

Geographical factors led to the development of medical studies in Salerno. This part of Italy had received an especially heavy importation of Greek influences in the days when the inhabitants of the Aegean peninsula were transplanting their culture to various parts of the Mediterranean world. Furthermore, the presence of mineral springs in the region of Salerno made it attractive as a health resort. Hence, there merged in this region a center for medical studies, based primarily upon the works of the famous Greek physicians. Galen was especially looked to as the medical authority. Here, then, was the basis for a *faculty of medicine* comparable to the faculty of law in Bologna and the faculty of theology in Paris.

Although each of the earliest university centers originally had but one faculty on the advanced level, the tendency developed to set up two or even three faculties at one place. The three original faculties of theology, law, and medicine came to be designated as the *learned professions*. In time, the growing interest in the more strictly literary and philosophical branches led to the formation of *faculties of arts* as well.

Scholastic Scholarship

The university scholar in the days of scholasticism was no less interested in acquiring knowledge of the good than is the dedicated scholar of today. However, his field of interest and method of inquiry were substantially different. Unlike many of the research workers on the staffs of modern universities, he did not believe it a proper use of his intellectual powers to seek ways of improving agricultural practices or of inventing new manufacturing processes. Increasing the supply of food and shelter or working out better systems of transportation and distribution were not his concerns. Search for knowledge of how to live well in this life was subordinated to the search for knowledge of what one must do and believe to live well in the hereafter, though some of the later scholastics, including Thomas Aquinas, did teach that the former concern merits some attention, too.

The method of inquiry was also different from the methods employed today. Wherever the scholastic tradition prevailed, inquiry began with premises or statements which were accepted as true without question or verification. The sources of these statements were known as the *authorities*. The authorities used by the theological faculties were books and papers held to have been divinely inspired, such as the Scriptures and the writings of the church fathers. The faculties of law consulted the Roman law, especially as it had been set forth by Justinian in the *Corpus Juris Civilis*. But the work of Gratian in the field of canon law also became widely renowned, and his *Decretum* became the major authority for scholars specializing in this branch of the law. The medical faculties looked to the works of Galen and Hip-

pocrates as the bases for their inquiries. It is almost unbelievable to a modern student, accustomed to identifying medical research with highly technical clinical procedures, that the physicians of Salerno and elsewhere sought to improve the practice of medicine by drawing *rational* inferences from statements found in the works of the ancient authorities. The contrast be-

Fig. 43. Medieval scholars searched for knowledge through disputation. From a woodcut by Hans Burgkmair.

tween the earlier method and that of modern medicine merely emphasizes the distinctive nature of the method of inquiry employed by the university faculties during the days of scholasticism.

The importance of the authority and the extent to which his views colored the products of scholarly inquiry were nowhere more evident than in the faculties of arts. The scholastics, especially the later ones, insisted that Aristotle should be admitted as an authority. The church opposed this move at first, and the issue over Aristotle was fought with much bitterness. When, as with Albertus Magnus and Thomas Aquinas, he was finally admitted, he became *the* authority. For several centuries thereafter, intellectual life in all but the narrower theological aspects was dominated by Aristotle's teach-

ings. All questions in science and philosophy were settled simply by quoting his opinion on the matter at issue. Science and philosophy were not freed from this domination until the rationalists, discussed in the preceding chapter, forged into leadership with their inductive procedures.

The Grammar Schools

As the universities developed, those individuals who wished to enter a learned profession met with increasing pressure to avail themselves of the specialized training offered by the several university faculties. To undertake advanced study the scholars must be able to read and use the authorities, which, in the days of scholasticism, were available almost exclusively in Latin. The ability to read Latin was therefore an absolute necessity for the university scholar. But by the time the universities were formed, the people inhabiting the lands of the former Roman Empire no longer used Latin as the everyday language of communication. By that time early forms of the modern Romance languages had evolved and were used in the conduct of everyday affairs. The Middle English used by Chaucer was now commonly spoken by educated people in England. Early forms of French, German, and Spanish predominated in the areas of Europe where these languages are now in common use. In Italy, the Italian used by Dante had replaced Latin as the language of the people. Thus, students congregating at a given university center could not speak with each other, understand the lectures, or read the books unless they had previously been given instruction in Latin.

To meet the need for proficiency in Latin, the collegiate and cathedral schools began to give more attention to the technicalities of Latin grammar. These schools, which once had been terminal in nature and whose graduates had entered directly into the work of the church or state, now took on more of the nature of preparatory schools. They became in fact *grammar schools* and left to the universities the task of providing professional training.

Language instruction has two aspects. The first involves the mechanics of communication. This is the more formal aspect and is designated by the term *grammar*. The second aspect involves the study of the literature written in the language studied. The study of literature was known to the scholastics as *rhetoric*. Rhetorical studies obviously have the merit of developing a sense of proper usage and good form. In this sense they are an extension of the grammatical studies and have language proficiency as their common objective.

There is another aspect of the rhetorical studies which involves more directly the content of the literary works that are read. It was in this sense

that the rhetorical studies came to be used to give the student a background of information. Rhetoric came to play much the same role history and philosophy play in the modern liberal-arts colleges. Because the scholastics were greatly interested in Aristotle, rhetoric came to include the study of some of the Aristotelian works in science and philosophy, along with the more traditional rhetorical works, which dealt in the main with theological matters.

Finally, of course, the university scholar in the days of scholasticism was expected to be proficient as a dialectician. Therefore, formal study in the processes of *deductive logic* came to occupy an important place in the curriculum of the preparatory or grammar schools. In fact, in time dialectical studies came to overshadow in importance the study of grammar and rhetoric; and these last two subjects became more or less elementary subjects, or studies preparatory to dialectic. We must understand that in the schools of the scholastics it was the *dialectical studies* which *provided the training in the scholastic method of discovering knowledge.*

Secular Support for Education

As the professions of law and medicine gained status and the content of the rhetorical and dialectical branches came to have reference to interests outside the field of theology, a demand for education developed among the common people. The growing interest in education was stimulated to a considerable degree by the development of the various crafts and skills and the rise of the commercial cities. The goods exchanged in the expanding commerce were produced by skilled craftsmen who controlled standards of workmanship and regulated production through their guilds. Unlike the upland agricultural regions, which were ruled by the feudal lords, the commercial centers were governed by the growing middle class, made up of merchants and guild members. If the members of the middle class were to negotiate in social, economic, and political matters on an equal footing with the nobles and the clergy, they needed an equal education. It was for such reasons that a demand for education developed among the middle classes —those who were neither born to rule nor interested in joining the ranks of the clergy.

While some persons of secular interests were taught in the church schools, these schools by virtue of their long tradition of serving a highly specialized purpose, were not well suited to serve the larger group of middle-class scholars who had more predominantly secular interests. Accordingly, some of the guilds and towns established their own schools. These were no different from the collegiate and cathedral schools save in the matter of their support and the student body they served. They offered the same subjects

and employed the same methods. Even the teachers were secured from the same sources. In brief, all these schools were *Latin grammar schools.* All of them offered instruction in the three basic subjects—grammar, rhetoric, and dialectic. The successful completion of the course of study at any one of the schools came to be marked by the awarding of the bachelor's degree. Possession of the degree entitled the holder to teach, if he was appointed by the bishop's office; and it also entitled him to be admitted to a university.

No mention has been made to this point of schools for individuals who did not aspire to enter the learned professions or to become Latin scholars. Indeed, there were no such schools provided on anything resembling a general scale prior to the rise of Protestantism several centuries later. It has already been mentioned that the common people now spoke only the "common" languages. But until the time of Dante and Chaucer there was no literature in their spoken language for them to read. Nor could they afford books, which, of course, were available at that time only in the very expensive handwritten form. They conducted their daily affairs according to the traditions of their ancestors. Instruction in religion was given orally by the parish priests. Not until developing commerical interests created a demand for the ability to read and write the common languages and to keep accounts did instruction in reading, writing, and arithmetic become generally available. Even then, such instruction was given privately and not in the grammar schools.

The grammar schools and the universities together thus constituted a complete, articulated school system. It was a system that catered to the interests of an elite class. Latin was the language of instruction throughout the system. As the vernacular schools appeared, they remained outside the circle of academic respectability, a situation that has persisted in some measure in most European educational systems to this day.

The stimulation given to intellectual activity by the scholastics resulted in large measure from their employment of the rules of deductive logic in disputations. Historians point out that the disputations were of two kinds. In one type, a given scholar developed a selected point, as Abélard had in the field of theology, by presenting first all the reasons supporting the stated point of view and then all the reasons opposing it. In the second type of disputation, the scholars were divided into two groups. One group was charged with presenting the supporting reasons, while the other group presented the negative side. This kind of disputation bears a resemblance to the modern debate.

At first, the disputations were genuine attempts to discover truth, but in time they degenerated into mere instructional or training exercises. Since the prevailing theology admitted of but one "right" point of view, the individual

or group asked to defend the "wrong" side of the case came to be known as the *devil's advocate*. However, since academic ability was measured in terms of the skill with which the participants employed the rules and techniques of the dialecticians, one may assume that under the pressure of academic rivalry students were sometimes driven to search rather widely in the acceptable sources for a novel approach or an overpowering argument. Though the endless disputations finally became somewhat pointless and were looked upon as a waste of time, they did serve a useful purpose for a while in setting free intellectual forces and arousing curiosity about matters which ultimately could not be confined within the bounds of the traditional authorities.

The Curricula Become Secular

As early as the thirteenth century, Thomas Aquinas had described the effort to improve man's well-being in this life as a thoroughly respectable

Fig. 44. A lecture room in a fifteenth-century university. (*Courtesy of the New York Public Library.*)

and worthy undertaking. Of course, efforts in this direction were to be conducted side by side with other inquiries which were more strictly within the area known to him as sacred theology. But the interest which now developed in the area known as natural theology soon led to the recovery of Latin and Greek books which described life in the better days of Athens and Rome.

Secular writers in the days of ancient Rome, such as Cicero, Vergil, and Quintilian, had given a rather detailed picture of the social conditions of their time. Those conditions now appeared to the medieval European to have been far superior to his own times. The contrast was so great that upon learning of the earlier societies many persons concluded that they represented the highest and most nearly perfect form of the good life to which man could aspire. Great efforts were therefore made to recover more of the works of the Greek and Roman authors and to incorporate what was learned from them in the lives of the readers. This marked the beginning of a great effort to recover the literature and art of the ancients and to reproduce a way of life held to have been the best the world has ever known. As we noted earlier, that movement became known as *humanism,* and it had important educational results, as we shall see.

As a direct result of the humanistic influences, the Latin instruction offered in the grammar schools was changed. During the many centuries when the church had shown little interest in scholarship, the Latin used by the clergy had been allowed to deteriorate. The church Latin now appeared awkward and inferior to that of Cicero. Hence, the humanists replaced the grammar and rhetoric textbooks, based on religious writings, with textbooks recovered from or prepared from the works of Cicero, Vergil, Ovid, and other Roman authors. Furthermore, it soon became apparent that Rome had borrowed heavily from Greek sources. Hence, the search quickly shifted to the recovery of Greek manuscripts. When in 1453 Constantinople, the capital of the Eastern Empire, fell to the Mohammedans, many Greek scholars fled to the West, bringing Greek manuscripts with them. They were welcomed with open arms by the eager humanists, and it was not long before many of the grammar schools were offering instruction in Greek grammar and literature in addition to the purified Latin studies.

The infusion of Greek literature throughout the centers of learning in Europe had a profound effect upon the philosophical outlook. The effort to improve this life now was judged worthy of the scholar, especially as he sought for knowledge of how to bring about such improvement in the newly recovered Greek and Roman classics. The Aristotelian works on science and philosophy became especially prized, and, as secular studies were extended, the popular demand for education expanded accordingly. On the university level the faculties of arts, dedicated to the general expansion of knowledge rather than to professional competency, gained a new importance. Greek and later even Hebrew became established as languages of instruction, and important works written in these languages were read. Turning to the original Greek and Hebraic forms of the Scriptures also had its effect upon the professional faculties. Theology, in particular, now experienced that reconstruction of traditional beliefs—based on a search of the original sources of Scripture—

which, as we saw in Chapters 7 and 8, ultimately brought on a Catholic as well as a Protestant Reformation in the sixteenth century.

The grammar schools maintained by the collegiate and cathedral centers now began to lose ground in competition with the growing number of municipal and guild schools. The latter, as a rule, were more willing to serve

Fig. 45. A medieval grammar school. The notations on the writing board suggest that music was included as a subject. (*Courtesy of the New York Public Library.*)

the secular interests of those who were not anticipating a career in the church. Furthermore, a new form of palace or court school appeared, supported by wealthy noblemen or even by the new merchant princes. The school of Vittorino da Feltre, established in 1428 at the request of the Prince of Mantua, was one of the first and most famous of the humanistic schools.

Vittorino's educational ideas were strongly influenced by the educational views of Quintilian and other Roman and Greek educators. His objective became that of preparing the sons of his elite patrons for their adult roles

as men of affairs. To this end, he utilized the historical, scientific, and philosophical content of the newly recovered learning. But he also introduced athletics, student government, and twenty-four-hours-per-day practice in gracious and courteous social living. This last was made possible by the fact that his school was operated as a boarding school. It was, in fact, the forerunner of a long line of famous boarding schools, some of which, notably several of the great public schools of England, are still in existence today. The practice of dividing the curriculum of the new grammar schools into grades or forms seems to have been introduced by Johannes Sturm at Strasbourg around 1537.

From the grammar schools reformed by the humanists were derived the *gymnasium* of the Germanic countries and the *Latin grammar school* so well known in England and colonial America. These are the most highly respected types of secondary schools in Europe to this day.

Inductive Reason Replaces Deductive Reason

The avid search conducted by the humanists in the recovered literature could not long avoid the inductive aspects of Aristotelian philosophy. An account of its impact on philosophical attitudes has already been given in the preceding chapter. The effect upon the schools when the scholars began to turn to inductive methods in preference to the deductive methods, however, deserves special attention.

We have seen how, by the time of the Protestant Reformation, humanistic influences had brought about a program of education based to a considerable extent on the ancient Greek and Roman classics. The institutional forms had come to consist of preparatory schools, called grammar schools, and the universities. In addition, purely secular interests were served in private vernacular schools offering instruction in reading, writing, and keeping accounts. We also observed how the Protestant educators had taken over these three institutional forms but had used the vernacular schools to teach all children to read the Bible, and the Latin and Greek studies to teach young men planning to enter the ministry to read the Scriptures in the original versions.

In the seventeenth and eighteenth centuries, the three types of schools were subjected to still another influence, that of mathematics. Bacon, Descartes, Leibnitz, and Spinoza each taught that human reason is so constructed that it may make its way to true knowledge from data acquired in experience. This produced the movement in philosophy known as *rationalism*. To the rationalists, discovering knowledge is an inductive process illustrated quite convincingly in the field of mathematics. Accordingly, they stimulated great interest in the mathematical branches as subjects that would develop ability

The Preface.

Scholes hung with *Philoſophick* Ornaments, or Contemplations, ſtollen out of the *Judaick* Ward-robe? Were not *Pythagoras*'s *College*, *Plato*'s *Academie*; *Ariſtotle*'s *Peripatum*, *Zeno*'s *Stoa*, and *Epicurus*'s *Gardens*, all watered with rivulets, though in themſelves corrupt, originally derived from the ſacred Fountain of *Siloam*? Whence had *Phœnicia*, *Egypt*, *Chaldea*, *Perſia*, with our Occidental Parts, their *Barbarick Philoſophie*, but from the ſacred Emanations of *Sion*? The Demonſtration of this is, πρῶτον ἀλγθὲς, the *original Idea* of this Diſcourſe.

But yet, notwithſtanding thoſe rich, and reſplendent *Derivations* of *Divine Revelation*, how much did the *Gentile* world ſolace it ſelf in its own native darkneſſe? what mixtures of *vain Imaginations* with *Judaick Traditions*? what muddie, dirtie *phantaſmes* did they mingle with thoſe *broken Traditions*, they received from the *waters of the Sanctuarie*? Neither was this the crime of the *Pagan* world only, but alſo of the *Church* of God; which has in all Ages, ſo far as the *ſpirit* of *Apoſtaſie* prevailed, been greatly fond of *vain Philoſophie*: And (which is a prodigious matter of aſtoniſhment) thoſe very *Philoſophick Traditions*, which the thirſtie greedie *Grecians* imbibed, originally from the *ſacred Fountain* in *Judea*, and afterwards, by many ſucceſſive *Metamorphoſes*, adulterated with their own fabulous, and ridiculous *infuſions*, I ſay, theſe very *Philoſophick* Traditions, thus Sophiſticated, both *Jews*, and *Chriſtians*, have in their declined ſtate, drank in, with as much greedineſſe, as the *Minor* Poets did *Homer*'s *Vomit*. And hence indeed, even from this bitter Root of *Vain Philoſophie*, have ſprung all *peſtiferous*, and *noxious Hereſies*, and *Idolatries*, which have cauſed ſuch miſerable Declenſions, both in the *Judaick*, and *Chriſtian* Churches. The Demonſtration hereof is the *ultimate*, and *ſupreme end* (next to the Glorie of God) I have had under *Intention*,

Fig. 46. Not all scholars welcomed the recovery of Greek and Roman literature or the adoption of the ways of reason. Specimen page from "The Court of the Gentiles" by Theoph. Gale, Fellow of Magdalene College, Oxford, 1671.

to think. Furthermore, the rationalists challenged the tendency of the earlier humanists to accept the scientific and philosophical beliefs of the ancient writers without question. Even Aristotle came to be questioned, and his scientific principles, so long accepted as infallible, were submitted to verification. In the process, a good many deeply ingrained beliefs were demonstrated to be false.

The effect of this close examination of traditional beliefs by the rationalists was to cast doubt on all that had until then passed for knowledge. A new beginning needed to be made, and the method of inquiry was to be that of inductive reason. All knowledge was now said to be available to him who was trained in the ways of inductive reasoning. The Greek and Latin studies were no longer thought to provide the answers to man's present problems. The most they could do was to assist in developing skill in using the method of scholarly research. The deductive logic which had caused the scholars to search the ancient sources for its authorities, and which had been the object of the dialectical studies in the grammar schools, was now replaced by the rules of inductive logic; and mathematical subjects replaced the disputations as exercises in the use of reason as the method of inquiry.

At the university level, the arts, headed by philosophy, became the center of scholarly attention. Philosophical inquiry was made to begin by questioning all that previous generations, even the ancients, had accepted as true. Propositions were reduced by analysis to first principles, or facts which are obviously true on inspection. From the first principles so established, scholars in the rationalist tradition proceeded to formulate by inductive synthesis the basic principles that would guide mankind to the good life. Blueprints for the ideal society poured from the centers of learning in large numbers. This was the age of the Enlightenment, when men—liberated men —were to be the masters of their own fate. Faith in the powers of unaided reason to deal successfully with the problems of men was unbounded, and the schools of the rationalists were designed to encourage that faith.

Rationalism, the philosophical movement which put its faith in the method of inductive reason, devised no new educational institutions. It did not even need the Protestants' vernacular schools on anything like the universal basis advocated by the religious reformers. Social leadership was to be provided by an intellectual elite, a leadership to be found by the schools in the competition of the grammatical and mathematical studies, after the fashion described by Plato. Those who survived this proving ground were judged to be the best minds available to cope with the problems of the day. The rigorous training afforded by the curriculum was expected to discipline those minds in the ways of right thinking and to harden them to their tasks. Latin grammar, Caesar, Cicero, Vergil, Greek grammar, Homer, al-

gebra, plane geometry, solid geometry, trigonometry, calculus—these were the proper preparing grounds for those who hoped to make a vocation of philosophy or one of the learned professions. The emphasis was upon providing a discipline of the mind, upon teaching the young to think straight

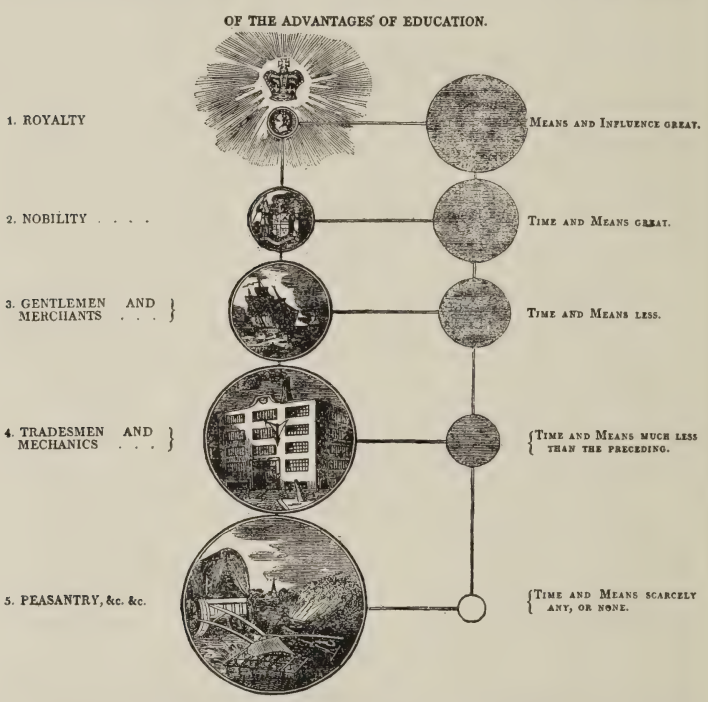

OF THE ADVANTAGES OF EDUCATION.
1. ROYALTY
MEANS AND INFLUENCE GREAT.
2. NOBILITY . . . .
TIME AND MEANS GREAT.
3. GENTLEMEN AND MERCHANTS . . .
TIME AND MEANS LESS.
4. TRADESMEN AND MECHANICS . . .
TIME AND MEANS MUCH LESS THAN THE PRECEDING.
5. PEASANTRY, &c. &c.
TIME AND MEANS SCARCELY ANY, OR NONE.

Fig. 47. An early nineteenth-century estimate of the need for education by the various social classes. (*Courtesy of the New York Public Library.*)

and constructively on any problem in any area of life. Like Plato, the rationalist expected to find in his schools the future leaders for the good state. The rationalist believed that such a state would follow inevitably from the vigorous use of inductive reasoning to discover knowledge of the good. Here lies the basis for the disciplinary concept of education in vogue today in those areas where the method of the rationalists is still accepted as the proper method of inquiry.

Historical records show that the Latin grammar school and the university were already well established on American soil before the mathematical branches became parts of the curricula of American secondary and higher education. The introduction of these subjects marked a shift away from the Puritan's exclusive dependence upon the Scriptures for knowledge of the good and toward the use of inductive reason as a method for discovering such knowledge. The frequency with which one still encounters teachers and laymen who expect education to teach the pupil to think and the faith such individuals express in the ability of mathematical and language studies to serve this end give evidence of how deeply the rationalist's philosophy ultimately became grounded in America.

CHAPTER 14

THE METHOD OF THE SENSE EMPIRICISTS

We are likely to be somewhat amazed by the complete confidence which scholastics and rationalists alike placed in the products of their respective logical processes. Both believed that proper reasoning brings forth knowledge that is absolutely true and can therefore be depended upon to lead us into the best ways of life. In contrast, modern people generally look upon knowledge produced in this fashion as mere *theory* and are somewhat skeptical of it. That is to say, we are likely to insist upon proving theory in practice before we take it seriously. But the men of the thirteenth through the eighteenth centuries who lived by the light of reason, whether of the deductive or the inductive kind, had no such reservations.

The record also shows that even while the scholastics were enjoying their greatest period of popular acceptance individuals occasionally appeared who dared to question the validity of their methods of inquiry. One of the most distinguished of these individualists, Roger Bacon, expressed grave doubts about accepting as true the propositions taken from authority without first verifying them in experience. Though a devout Franciscan monk living in the thirteenth century, he wrote, "Of the three ways in which men think they acquire knowledge of things, *authority, reason,* and *experience,* only the last is effective and able to bring peace to the intellect." His tendency to check on his sources by making his own observations led him to become a Greek scholar, a very rare accomplishment among the intellectuals of that period. He spent considerable effort searching the Greek as well as the Latin sources of religious doctrine and was led by his studies to disagree with the accepted teachings on numerous points. This fact is evident from the story of his difficulties with the ecclesiastical authorities of his day. It is a matter of record that some of his writings were not permitted to be made public for many years.

We recall that just as the scholastics accepted the authority of the church fathers in matters theological so also did they turn to Aristotle as the authority in matters philosophical and scientific. Thus, whenever a scholar quoted Aristotle as the authority for a given statement or point of view, its validity was held to have been established. However, Roger Bacon began to check upon the data employed by Aristotle by making his own observations. The results led him to believe that "the doctor" had not always observed correctly and that his conclusions, especially on scientific subjects, had not been made without error. Bacon therefore strongly criticized Albertus Magnus, Thomas Aquinas, and other scholastics of his day for their unquestioning acceptance of the teachings of Aristotle. He insisted that Aristotelian philosophy could not be taken as the starting point of deductive inquiry except with respect to those matters which were verified through personal experience and observation.

Backgrounds of Modern Science

While Roger Bacon was urging his fellow philosophers and theologians to rely more strongly upon personal experiences and observations, a few men of a practical turn of mind were beginning to seek technological advances by employing rudimentary scientific methods. The prevailing feudal system, based as it was upon an agricultural economy, supported a ruling class. The members of this elite group aspired to an aristocratic status which would set them off from the lower class. They adopted secular interests and pursuits designed to enhance the enjoyment of this life and to mark them as persons of leisure and distinction. The arts and implements of warfare came to occupy an important place in their daily affairs and led to the customs and practices associated in our minds with the romantic days of knighthood. The intervals between military campaigns invited the restless warriors to engage in various types of vigorous outdoor activities. Quite naturally, many of them turned to hunting as a pastime.

Though animals and birds had been used by hunters long before the thirteenth century, the nobility of this period seems to have developed a particularly strong interest in the falcon. The interest was so strong in the court of Emperor Frederick II that a book on this subject was produced which is known as *The Art of Falconry*. It is significant to us because the writer obviously made many careful observations and even a few experimental studies in pursuing his subject. It was from such objective data rather than from the authority of tradition that the writer drew his conclusions and made his recommendations. Hence, historians are inclined to point to *The Art of Falconry* as the first concrete evidence that in his search for knowledge of the good Western man was beginning to turn from the

methods of faith and authority to the methods of discovery based on observation and experience. Some even claim that this book marked the beginnings of experimental science in western Europe. Whether or not we

Fig. 48. Conrad, a twelfth-century German king, hunting with a falcon. From a Minnesinger Manuscript of the Fourteenth Century.

agree, it is significant that within only two centuries Christopher Columbus had dared to contradict the teachings of traditional philosophy and theology with evidence derived from the senses.

It was Leonardo da Vinci, a contemporary of the bold Genoese sailor, who demonstrated more fully the potentialities of the scientific method for the improvement of life. He was not so much a philosopher as an amateur

scientist and inventor. Though not given to systematic writing, he left behind a substantial body of notes which indicate that, for Leonardo, the search for knowledge must begin with observation and that the inferences drawn therefrom must be confirmed in experimentation. He wrote: ". . . those sciences are vain and full of errors which are not born from experi-

Fig. 49. Before Columbus returned from America the ocean was regarded as "The Sea of Darkness" and as inhabited by monsters and demons.

ment, the mother of all certainty, and which do not end with one clear experiment." It is also evident that he recognized the value of mathematics as a scientific tool, for he said that when the data gathered through observation are treated mathematically greater precision will result.

By employing the suggested methods and techniques himself, he was instrumental in launching new efforts to understand the physical environment and thereby harness it in the service of man. He cast doubts upon the work of the alchemists and astrologers, for he believed it to be based upon false premises. On the basis of his own experiments in the realm of physics and his observations in the fields of astronomy and anatomy he concluded that "nature is orderly, nonmagical, subject to immutable necessity." It has been

suggested that if Leonardo had published these views it might be he and not Francis Bacon from whom the beginning of the scientific movement is now dated.

Fig. 50. The learned men knew that Columbus was either demented or under the power of Satan. Hence, the Council at Salamanca heard his bold plan with skepticism.

A New Astronomy

In Leonardo's insistence that physical phenomena and natural events are the products of immutable necessity, a fundamental principle of the evolving scientific movement was proclaimed. This principle contradicted the prevailing belief that many events of everyday life were produced by the direct intervention of the supernatural. Eclipses, electrical storms, mental illness, accidents, and disease—all were looked upon as signs of the workings of a supernatural power. Leonardo's attitude tended to picture these as natural events and called for the study of such phenomena to determine their causes. With knowledge of their causes, it was thought that men might be able to control the events themselves and thereby produce the particular kind of environment or chain of experience they most desired.

Such a line of reasoning may seem very obvious and even trite to us, but to the people of the sixteenth century it was nothing less than revolutionary. Before large numbers of people could think about nature as Leonardo had, it was necessary for someone to demonstrate that the universe was, in fact,

a huge machine that operates according to fixed and unvarying laws. The honors for achieving this shift in popular beliefs belong to a line of astronomer-mathematicians which began with Copernicus and ended with Newton.

Medieval man had been told by his theologians as well as by his philosopher-scientists that the earth was the very center of the universe. Around a supposedly unmoving and relatively flat earth-center, the sun, moon, and

Fig. 51. The astrologer was still an important figure in Medieval Europe, and remained so until modern science was developed and accepted.

other celestial bodies were said to revolve in circular orbits. This theory of an earth-centered universe is known as the Ptolemaic theory, named after Ptolemy, one of the scientists at Alexandria in the second Christian century. Obviously, Ptolemy's description of the universe tended to reinforce the religious belief prevalent in Leonardo's time that the earth is the focal point of God's interest and that man, as the chief object of divine creation, is under direct and continuous observation by his Maker. It has been suggested that this view may have contributed, at least in part, to the medieval preoccupation with God-man relationships and to the corresponding neglect of those things which have to do with man in his relation to his natural environment.

Though numerous individuals before him had speculated on the matter, Nicolaus Copernicus generally is recognized as the first Christian scholar to contradict successfully the Ptolemaic theory of the universe. This he did

about A.D. 1530 when he published a short paper setting forth his theory of a sun-centered universe. He believed that the sun was the unmoving center around which the earth and other planets revolved in circular orbits. Apparently, Copernicus, still under the influence of Aristotle on this point, was not yet able to conceive of celestial movements in other than circular paths.

Though the Copernican theory was slow to be accepted, a growing interest in mathematical speculation tended to bring support to his views. Less than a century later, Tycho Brahe and Johannes Kepler observed a harmony in the planetary movements which convinced them that the Copernican theory of a heliocentric universe was to be preferred on mathematical grounds to the Ptolemaic system. Brahe's work consisted, in the main, of making careful observations of the planetary movements. His observations were confirmed and extended by Kepler, who then inferred his three famous laws. Of these three, we are interested primarily in the discovery that the orbits of celestial bodies are elliptical in shape rather than circular—a fact that later contributed directly to Newton's inferences regarding the force of gravity.

Because the theories advanced by Copernicus and Kepler were grounded on a very limited body of sense data and were developed by the methods of mathematical inference, their arguments in support of the theory of a heliocentric universe must be classified as *theoretical* arguments. Specifically, their line of reasoning proceeded on the unconfirmed assumption that the universe was constructed along mathematical lines and, thus, that whenever a particular theory has been put in the form of a valid mathematical equation its validity has been demonstrated. In this sense, their reasoning was scarcely more scientific than that of the rationalists, who made their inferences on the basis of logical necessity alone. The final conclusive step required by modern science, namely, the verification of theory with further observations, was not as yet established. Nor could this step be taken to prove the Copernican theory until Galileo Galilei perfected the telescope early in the seventeenth century.

Galileo's telescope was, of course, merely a device for extending the range of the human eye in its search for sense data. But when the renowned Galileo turned it toward the heavens, he found the factual proof needed to confirm the basic premises of the Copernican system. Those who dared look could see for themselves the evidence with which to refute the teachings of the medieval, as well as of some of the ancient, philosophers and theologians. The movements of the celestial bodies were found to have a regularity and precision which suggested that each body is an integral part of a great mechanical system. In the vast expanse of space revealed by the telescope and among the unlimited number of celestial bodies, the earth and its inhabitants now appeared to be rather insignificant instead of occupying the central position. In the face of this disturbing evidence, it is not sur-

prising that some of the orthodox preferred to believe in the old astronomy as a demonstration of their faith. It has been said of them that "the professor of philosophy at Padua refused to look through Galileo's telescope, and his colleague at Pisa labored before the Grand Duke with logical arguments, 'As if with magical incantations to charm the new planets out of the sky.' " [1]

Galileo's curiosity did not permit him to spend all his time scanning the heavens with his new instrument. His observations satisfied him that the celestial bodies follow fixed paths and travel at regular speeds. Their behavior, therefore, was said to be predictable and capable of being calculated for any specific time. This fact tended to confirm the assumptions made by Copernicus and Kepler that celestial phenomena and events obey mathematical laws and that the laws themselves can be expressed in mathematical terms.

But Galileo now concluded that terrestrial phenomena and events might have a similar regularity. If so, they, too, might be shown to obey laws capable of being expressed as mathematical formulas, and the operation of those laws, too, might be predicted with precision. It was this line of reasoning which led him to investigate the speed of falling bodies and other phenomena in the field of dynamics. Such studies persuaded him that physical objects have no inner power of initiative and motivation but are inert and subject to the pressures of specific, unvarying universal forces. He concluded that such forces act upon all objects in similar and equal manner and that it is these forces rather than the inner nature of the objects themselves which *cause* the events we encounter in everyday experience. From this conclusion, it was but a relatively short step to the description of the universe given by Newton and to the explanation of the workings of both the celestial and the terrestrial systems in terms of mechanical necessity.

Newton's Machine Universe

Isaac Newton was born in 1642, the year in which Galileo died. By that time, the Copernican theory of a heliocentric universe was receiving respectful attention in most academic centers, but especially among the mathematicians. It was to be expected, therefore, that the young Newton, a mathematician of promise, would be led to review the work of Copernicus, Kepler, and Galileo and to explore the implications of the new astronomy. Through his studies he was persuaded that the celestial bodies are indeed inert masses whose motion through space is modified by external forces that act upon them. From his own studies in the field of dynamics, as well as from

[1] William Cecil Dampier-Whetham, *A History of Science,* New York, The Macmillan Company, 1930, p. 142.

those of Galileo, he concluded that an inert body once set in motion will continue that motion in a straight line indefinitely unless the movement is opposed by external force or the direction is changed by external force. That is to say, the motion of such a body is determined exclusively by the external forces which act upon it.

To Newton, the celestial bodies appeared to be moving freely in space. He assumed that they were set in motion at the time the universe was created and that it was God, the *First Cause,* who had imparted to them the initial cosmic push. Theoretically, they should now move in straight lines at regular speeds. Actually, he observed that they moved in elliptical paths. The deviations in their movements from straight lines, he inferred, were the result of a force which is centered in the bodies themselves and which acts upon other bodies from these centers. This force he identified as gravity. By observing carefully the extent to which the celestial bodies were diverted from a straight-line path when they came within the range of influence of other bodies, he calculated that the amount of gravitational influence exerted by the force centered in a given body was directly proportional to the mass of the body, and was in inverse proportion to the square of the distance of the body from other bodies. This, in general terms, was his famous law of gravity. By means of it, he was able to predict celestial events and to infer the existence of unseen planets and celestial bodies and calculate their size and location many years before they were discovered by means of the instruments and techniques of the astronomer.

But, like Galileo, Newton was not content to focus his attention on celestial matters alone. The success of his theories regarding the nature and behavior of heavenly bodies led him to believe that the objects of this earth may have a similar nature and may be subject to the same or similar forces. Thus, he inferred, the earth and all the material objects in it are composed of small, unchanging, inert bodies which resemble on a microscopic scale the inert, unchanging, freely moving celestial bodies. He reasoned further that these minute, cosmic building blocks, or atoms, have definite, fixed and identifiable qualities or properties. Though they themselves cannot be divided, they can be combined with each other in various orders, and the resulting masses or objects will possess the qualities of the several parts. The larger systems of atoms may also be combined with other systems to form still larger systems. Or, conversely, the systems may be disassociated, leaving the original particles unchanged and in their primary states. Since they are inert, the particles were said to be associated or disassociated as a result of the influence of forces. Because the mass of the particles themselves was believed not to change and the forces also were thought to remain constant, terrestrial events were said to be capable of being described mathematically and of being

predicted with a precision equal to the descriptions and predictions that had been made of celestial events.

Newton's position on these matters was clearly stated in the following selection from the *Opticks:* [2]

. . . it seems probable to me, that God in the Beginning form'd Matter in solid, massive, hard, impenetrable, movable Particles, of such Sizes and Figures, and with such other Properties, and in such Proportion to Space, as most conduced to the End for which he form'd them; and that these primitive Particles being Solids, are incomparably harder than any porous Bodies compounded of them; even so very hard, as never to wear or break in pieces; no ordinary Power being able to divide what God himself made one in the first Creation. While the Particles continue entire, they may compose Bodies of one and the same Nature and Texture in all Ages: But should they wear away, or break in pieces, the Nature of Things depending on them, would be changed. Water and Earth, composed of old worn Particles and Fragments of Particles, would not be of the same Nature and Texture now, with Water and Earth composed of entire Particles in the Beginning. And therefore, that Nature may be lasting, the Changes of corporeal Things are to be placed only in the various Separations and new Associations and Motions of these permanent Particles; compound Bodies being apt to break, not in the midst of solid Particles, but where those Particles are laid together, and only touch in a few Points.

It seems to me farther, that these Particles have not only a *Vis inertiae* [inertia], accompanied with such passive Laws of Motion as naturally result from that Force, but also that they are moved by certain active Principles, such as that of Gravity, and that which causes Fermentation, and the Cohesion of Bodies. These Principles I consider, not as occult Qualities, supposed to result from the specifick Forms of Things, but as general Laws of Nature, by which the Things themselves are form'd; their Truth appearing to us by Phaenomena, though their Causes be not yet discover'd. For these are manifest Qualities, and their Causes only are occult. . . . To tell us [as the Aristotelians have] that every Species of Things is endow'd with an occult specifick Quality by which it acts and produces manifest Effects, is to tell us nothing: But to derive two or three general Principles of Motion from Phaenomena, and afterwards to tell us how the Properties and Actions of all corporeal Things follow from those manifest Principles, would be a very great step in Philosophy, though the Causes of those Principles were not yet discover'd: And therefore I scruple not to propose the Principles of Motion above-mention'd, they being of very general Extent, and leave their Causes to be found out.

Newton studied the phenomena by which he believed the "general Laws of Nature" appear to us, and from his data he developed numerous "Principles of Motion." These principles he expressed in the form of mathematical

[2] Sir Isaac Newton, *Optiks,* reprinted from 4th ed. by George Bell & Sons, Ltd., London, 1931, pp. 400–402.

formulas, by means of which he believed it was possible to predict future events by taking into account their purely natural causes. The events, as well as the sensory qualities or phenomena by which we know them, were now said to be the products of *force* operating on *mass* within the limits of *time* and *space;* and the effect of a given force operating on a given mass was stated in terms of where that mass would be at a given time.

The terrestrial system, as well as the celestial system, it now seemed, was a machine with the behavior of all its parts governed by machine principles. Mortal man, because of his physical nature, was now thought to be part of the machine, and he was expected to find his greatest good while on earth in fulfilling his role in the mechanism by learning and using the machine principles as his guides in conducting his daily affairs.

To orthodox theologians of that day, most of whom still believed that God personally directed the affairs of every part of this universe, Newton's description of both terrestrial and celestial events as the products of the operation of strictly mechanical principles bordered on the sacrilegious. It should be stated at once, and with emphasis, that Newton intended no disrespect. But it does appear rather obvious that, to the orthodox, his theory would seem to push God out of the heavens and earth and to relegate Him to the more remote role of Creator and *First Cause*. Indeed, some later theologians and philosophers, strongly influenced by Newton, actually did picture God as the Great Clockmaker, who, having created this machine universe, wound it up, set it in motion, and promptly turned to other matters. They said that from the first moment every event has been in response to clearly identifiable natural causes and has been produced in a strictly mechanical fashion. This, in a general sense, is the *deistic* position, a theological system which was very attractive to many Europeans and to some prominent early Americans, including Benjamin Franklin.

The Natural Order Is Good

As the Newtonian concept of the universe gained acceptance, the doctrine of immanence began to take on a new meaning and importance. The Aristotelians, it will be remembered, had used scientific inquiry to study the individual and the particular with a view to learning the basic nature of their species or class. That is, they were seeking to discover knowledge in the form of universals; for it was assumed that when they had learned to know the form or nature common to all members of a class, they had come into possession of the standards by which to judge the individual and particular. Thus, to the Aristotelians, the doctrine of immanence referred to the presence of the universal in the individual, and his search for knowledge

of the good consisted of abstracting from the individual and particular that which belongs to the nature of the universal.

Newtonian science, on the other hand, tended to treat individuals and even species as unimportant save for the light the study of them might throw on the workings of the universe as a whole. Newton sought knowledge of the "principles of motion"—that is to say, the laws of nature which cause and direct the course of events. It is such knowledge, he believed, which will tell men how the cosmic machine operates and how they may take their appointed places as integral parts of it. The will of God for man and the laws of nature were, to Newton, one and the same thing.

In a sense, therefore, Newton believed that the future has already been determined for us. It was so determined when God created the universe and placed man in it. That future is now in the process of being ground out for us by the workings of the machine universe. Newton wrote that the stream of cause-effect relationships had been set in motion "in the first Creation by the Counsel of an intelligent Agent. For it became him who created them to set them in order." [3] What God in His infinite goodness and wisdom determined at the outset, the laws of nature and the unrelenting forces of mechanical necessity would bring to full fruition.

To Newton and his followers, the nature of the cosmic system was said to be capable of being discovered by the very fact that it is indicated in every natural event and process. It is capable of being known because the phenomena are *manifest,* that is, they appear to us through our physical senses. Knowledge of the good, therefore, is to be gained from a systematic study of these phenomena through the use of our senses. We shall come to know the good to the extent that we discover the secrets of the natural order, and we shall achieve the good life by conforming to that order. Francis Bacon had expressed essentially the same view when he said, "We conquer nature through obeying her."

Discovery Begins with Sense Data

Newton's scientific works aroused great activity among the philosophers of his time because his discoveries made it necessary for them to adopt a new world view. As a consequence of this activity, use of the scientific method as a way to discover true knowledge was established in philosophical circles in a surprisingly short time. Perhaps this was made easier because some of the necessary groundwork had already been laid by men like Francis Bacon and Thomas Hobbes.

[3] *Ibid.,* p. 402.

In the preceding chapters it was shown that Francis Bacon set philosophical inquiry on the paths of inductive reasoning almost a century before Newton's principal works were published. Furthermore, Bacon insisted that if induction is to be valid it must begin with premises that are known to be true. This, he said, can be assured only if all propositions used in induction are reduced by analysis to their simplest forms or constituent elements and if these in their turn are shown to be true beyond question. We also saw how the rationalists, for example, Descartes, were content to accept as true any statement or proposition which on mere inspection by any reasonable person appears to be so. The axioms of mathematics are examples of statements which they said belong in this category. Statements so accepted were known by them as *first principles,* a term indicating that the inductive process might safely begin with them.

Thomas Hobbes, however, questioned the validity of first principles and similar so-called "self-evident propositions." What is accepted as true, even by a great many individuals, he insisted, may in reality be nothing more than deep-seated prejudices or views to which members of a given race or society have become accustomed because of a long tradition. The types of judgments which are validated by mental inspection alone are not therefore necessarily true and may not safely be used as the foundations of knowledge. Concerning the origin of true knowledge, Hobbes wrote in 1651 as follows: [4]

> Concerning the Thoughts of man, I will consider them first *Singly,* and afterwards in *Trayne,* or dependence upon one another. *Singly,* they are every one a *Representation* or *Appearance,* of some quality, or other Accident of a body without us; which is commonly called an *Object.* Which Object worketh on the Eyes, Eares, and other parts of mans body; and by diversity of working, produceth diversity of Appearances.
>
> The Originall of them all, is that which we call SENSE; (For there is no conception in a mans mind, which hath not at first, totally, or by parts, been begotten upon the organs of Sense.) The rest are derived from that originall.

Hobbes's assertion that all knowledge is derived initially from sense data received strong support from John Locke a few years later. Locke came to believe that at the time the infant is born its mind is as a blank tablet, a *tabula rasa.* Since his mind is completely devoid of ideas, the infant is not capable of consciousness and is, indeed, born unconscious. From the moment the sense organs are ready to function, however, simple sensory experiences, such as light, cold, pain, hunger, and noise, are impressed upon his mind. These simple sense experiences Locke called *ideas of sensation.* They were thought to be retained in the mind by the mental faculty of *memory.*

[4] Thomas Hobbes, *Leviathan,* A. R. Waller (ed.), reprinted from the 1st ed. by Cambridge University Press, New York, 1904, p. 1.

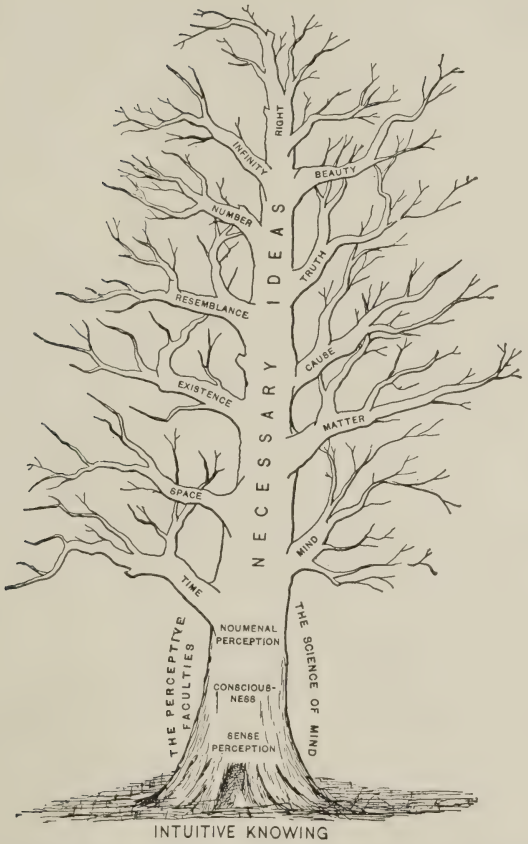


Fig. 52. Chart of Intuitive Knowing. All knowledge is derived by induction from sense perceptions. (*After Joseph Baldwin, Elementary Psychology and Education,* 1895, *p.* 91.)

As the infant grows older and his store of sense impressions—or ideas of sensation—increases, it was thought that they could be organized, related to, and compared with other ideas of sensation, by the faculty of *reason,* to form *ideas of reflection.* Clearly, it was said, the ideas of reflection are built up or generalized from the ideas of sensation already in the mind; and the quality and level of the generalizations drawn are dependent upon the number and quality of the primary impressions the senses have previously presented to the mind. In the chapter that follows, we shall see how men like Pestalozzi and Herbart developed these psychological theories more fully and applied them to the problems of instruction.

The role of the scientific method as a way to discover knowledge of the good, at least as the scientific method was understood by Hobbes, Locke, and others who lived in the seventeenth and eighteenth centuries, is now clear. In general, they believed that we learn how to live the good life, first, by discovering the secrets of nature and, then, by using that knowledge to guide us in formulating our purposes as well as in shaping our actions to achieve them. In our search for knowledge of the secrets of nature, the physical senses are our primary tools. We proceed by accumulating sense data, by analyzing and comparing the sense data, by generalizing from them, and, finally, by testing the generalizations against any sense data that we may gather subsequently.

But as a practical matter, we find that the universe is too large to be studied all in one piece. The search for knowledge must be made to focus upon particular features, given types of cases, and specific problems, as, for example, in determining the size and shape of the earth or the cause of smallpox. The investigators must begin by isolating their problems. Then they must collect all the relevant data that can be secured by means of the senses. When sufficient data have been collected, they must be examined to learn their common elements as well as their differences. The *inductive* character of this discovery process resides in the manner in which the investigator proceeds from the individual ideas of sensation to the generalizations or ideas of reflection. The generalizations, some have held, are inherent in the data themselves and are discovered in them. This is what Newton meant when he said, "I do not invent my hypotheses." Knowledge so discovered quite understandably was thought to enjoy cosmic sanction and to be true everywhere and for all time.

This method of discovering knowledge is here described as *sense empiricism* [5] because it begins with sense experience and is verified in sense experience. In this process, no sense data may be ignored. The generalizations

[5] This term is taken from John Dewey's writings. Dictionaries of philosophy are not likely to list it, at least not in the sense used here. They are more likely to label the tendency to look upon all knowledge as having its origin in sense experience as *sensationalism.*

must be made to fit the facts, not the facts to fit the generalizations. In this way, "The world is not to be confined (as hitherto) within the straits of the intellect, but the intellect is to be enlarged to receive the image of the world, such as it is." [6]

The Natural Sciences

The growth of the natural sciences after the adoption of the scientific method for discovering knowledge has been of almost unbelievable propor-

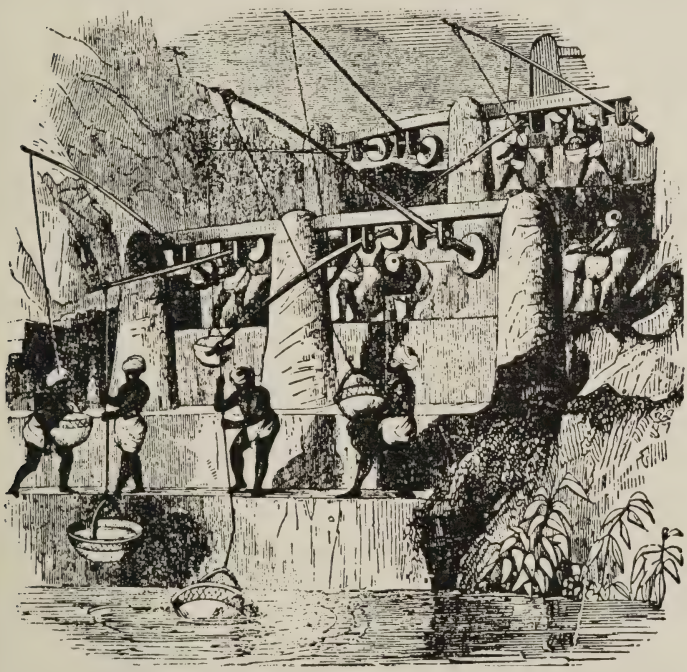


Fig. 53. The shadouf was a "machine" used to raise water from the Nile before scientific knowledge made possible the invention of better machines.

tions. Scientific knowledge is cumulative, and, as the body of sense data has expanded, later scientists have been able to correct and to extend the gen-

[6] Kuno Fischer, *Francis Bacon of Verulam,* London, Longmans, Brown, Green, Longmans, and Roberts, 1857, pp. 94–95.

eralizations drawn by their predecessors. Even though he worked independently, each investigator has added his small collection of carefully derived data to the common fund. Thus, scientific knowledge has been developed over the years from primary sense data to speculative hypothesis, and from theory to law. True knowledge is believed by the sense empiricist to emerge from the toils of research. It is said to become apparent to us whenever sufficient research has been carried out. The conviction has grown that the best scientist is also the best philosopher, and the ivory tower has been succeeded by the laboratory as the seat of learning. The sense empiricist has taught us

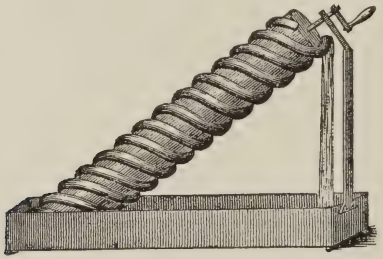


Fig. 54. The development of Greek science enabled Archimedes to invent the water screw.

that it is no longer necessary for men to wait for revelation or inspiration before they can know the true, the good, and the beautiful. Now men may search for such knowledge, and the harder they work the quicker they may expect the desired knowledge to be discovered. The modern age of scientific research and technology was born out of this hope.

The Social Sciences

Limitations of time and space do not permit more than a passing reference to the manner in which the scientific discoveries of Newton, Laplace, Priestley, Dalton, Faraday, Helmholtz, and many other equally eminent scientists brought powerful support to the theory that true knowledge may be discovered by those who begin their search with sense data and confirm their inductively established hypotheses with further sense data. As a result of their successes, the methods of scientific inquiry soon came to be regarded as the proper method for discovering truth in all fields of endeavor, and there came a demand to use this method to point the way to social and political reforms as well.

The problem of extending scientific techniques into the social realm is no-

a simple one, however. Observations made of the social processes cannot readily be stated in precise, quantitative terms, such as those used to describe physical processes. Nor do human subjects and social institutions readily lend themselves to the purposes of controlled experimentation, as do the inanimate materials and objects studied by the physical scientist. Nevertheless, the effort to develop a social science seemed justified to many who longed for reforms, and several beginnings were attempted.

One of the better known among the early efforts to develop a social science was that made by Jeremy Bentham. In searching for a way to describe the

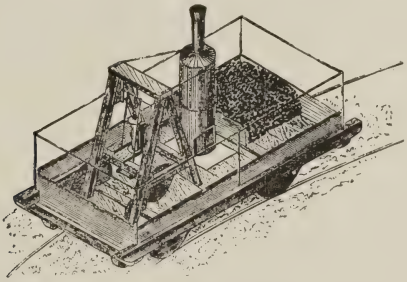


Fig. 55. The beginnings of modern science enabled man to utilize energy sources other than his own body, such as in this, the first locomotive built in America.

workings of the social process and to measure the effects of specific social factors in quantitative terms, he concluded: "Nature has placed mankind under the governance of two sovereign masters, *pain* and *pleasure*. It is for them alone to point out what we ought to do, as well as to determine what we shall do. On the one hand the standard of right and wrong, on the other the chain of causes and effects, are fastened to their throne." [7]

The implications of Bentham's premise are obvious. When two courses of action are open to us, one producing pain, the other pleasure, clearly it is *right* for us to choose the latter; when two courses are before us, both leading to pleasurable consequences, the course which results in the greater pleasure is to be preferred; and when the choice lies between courses that result in pain, it is the lesser pain which shall be our choice. The good can thus be distinguished from the less good or the not-good on a strictly quantitative basis. We need merely employ scientific techniques of observation and measurement to determine the *quantity* of pleasure or pain that follows from a given

[7] Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation,* in *The English Philosophers from Bacon to Mill,* New York, Modern Library, Inc., 1939, p. 791.

act or arrangement in order to learn the measure of its goodness or badness. For Bentham, it followed logically that the social scientists must make it their central business to measure and make known the relative value of each practice, institution, and arrangement, and it was he who gave us the idea of "the greatest good for the greatest number" as the objective of the good society.

Bentham's social principle is known as *utilitarianism*. It was adopted and expanded by James Mill and John Stuart Mill, father and son. In the hands of the latter, utilitarianism as a thoroughgoing philosophical system reached its highest level. "The whole empirical logic of Mill," wrote Dewey, "professedly, and as far as consistent with itself, is an endeavor to show that all propositions involving reflections and ideas must be proved, or demonstrated to be true, by reduction to propositions consisting only of material directly given in sensation." [8]

In the eyes of the utilitarians, as well as of the French *physiocrats,* man and his society now appeared to be subject to the same kinds of cause-effect operations as are the inanimate objects of the physical universe. Human behavior was said to be controlled and predicted just as readily as events in the laboratory of the physicist. Accordingly, the social scientist was urged to discover the laws which govern social change and, by that knowledge, to control the actions of men in such ways that a maximum measure of happiness would prevail for the largest number possible.

The actions of men may be controlled, it now was said, by controlling their environments. Thus, Helvétius proclaimed that education is the all-powerful instrument by which any chosen type of society may be produced. And Robert Owen, the philanthropic English industrialist, built model villages for his workers on the theory that ideal surroundings would produce ideal individuals. Other experimental social organizations and community projects were launched in the firm belief that men of evil natures would inevitably become good when given the proper environmental conditions. In brief, the future of man seemed at long last to be assured. That future, it was believed, rested in the hands of the *social engineers*—the social technicians who, by virtue of scientific discovery, knew what was positively good and were equipped with the means to make that good prevail. To the social scientist of this persuasion, man as well as his society was regarded as an integral part of the great machine universe and subject to the domination of similar machine principles.

[8] John Dewey, *Quest for Certainty,* New York, Minton, Balch & Co., 1929, p. 112.

CHAPTER 15

LEARNING TO DISCOVER AND USE SCIENTIFIC KNOWLEDGE

The scholastics and the rationalists had not found it necessary to make a completely new beginning when they turned to education as a means for implementing their philosophical ideas. They had been content for the most part to improve and extend the basic institutional patterns they had inherited from their predecessors. Thus, the scholastics had done little to change the nature of the cathedral schools except to shift from the former emphasis on mastering Latin grammar and literature to developing skill in the use of the deductive method of reasoning. True, their intensive application of these skills in the fields of theology and law had brought about the development of the university faculties, but in the beginning these were little more than an advanced level of the same type of dialectical studies carried on in the cathedral schools. The rationalists, in their turn, had extended and enriched the curricula developed by the scholastics. This they had done, first by adding Greek to the Latin studies and then by adding the mathematical branches as well. The educational emphasis even with the later rationalists continued to center upon the development of powers of reasoning, and to this end their schools, like the schools of the earlier rationalists and the scholastics, were expected to discipline the minds of the scholars rather than to fill them with knowledge. In sharp contrast to the above, the philosophical and psychological theories of the sense empiricists called for sweeping educational changes.

Francis Bacon, it will be recalled, was adamant in his insistence that philosophy should give up theology and be made to deal with secular matters. He was appalled that mankind had made so little progress in dealing with the problems of hunger, sickness, and social relationships during the two thousand years that separated him from the early Greek naturalists. This

Fig. 56. Medieval men frequently submitted their problems to the clergy who, in turn, disposed of them with a judgment of God as portrayed by this title page of a missal in the Bamberg Library.

failure he attributed to the faulty methods of inquiry which had been used. To set inquiry on the right track, he suggested that philosophers reject the traditional authorities and start anew in their search for knowledge of the good by drawing all inferences and propositions from the data of experience. Propositions so formulated, he insisted, must either be confirmed in subsequent experiences or be rejected. Only properly verified propositions were to be regarded as true and as knowledge suitable for directing the everyday affairs of men. Given valid knowledge, he believed, mankind might be put upon the road to a much better life. His method for acquiring valid knowledge is, of course, recognized as the inductive method.

The scientific and technological improvements which followed in the wake of the Baconian reforms were reviewed briefly in the preceding chapter. Thomas Hobbes, John Locke, and Sir Isaac Newton were only a few of that long line of determined men who risked security of person and property in the search for knowledge believed capable of improving man's status. It has already been noted that these men turned to *sense data* as the *only* form of *experience* upon which a valid system of knowledge might be built. The present purpose is to describe the psychological theories which were developed to explain how knowledge was thought to be discovered from sense data and to outline very briefly some of the significant educational practices that have been developed from those theories.

Locke on Discovering Knowledge

Locke's views on the manner in which we secure knowledge that leads to the good life are quite logical if we grant his basic assumptions. It will be recalled from the preceding chapter that he believed knowledge is built up inductively from the data of sense experience. If this is so, he reasoned, the individual has no knowledge until after he has had some sense experiences. The mind of the newborn child, devoid of experience, is therefore as a blank sheet of paper, or *tabula rasa*. With nothing in his mind the baby has nothing of which he can be conscious and therefore spends his first days in a state of unconsciousness.

Almost from the first, however, the infant's senses are active. They receive impressions from the outside world, and these impressions leave their traces in the mind. These simple sensory impressions Locke called *ideas of sensation*. He assumed that the infant accumulates separate ideas of sensation from the objects of his environment, such as the hardness of his bottle, its weight, its color, its temperature, and the pleasant taste of its contents. After a sufficient number of such ideas of sensation have been accumulated, the baby is capable of becoming aware of all of them at one time. From such awareness or consciousness of them, a general idea involv-

ing their relatedness or meaning can be formulated. This, Locke held, would be an *idea of reflection*. Evidence that the baby has formed some ideas of reflection from the ideas of sensation appears to us when he begins to reach for or cry for the bottle when he sees it standing on a nearby table. In brief, by combining and compounding ideas of sensation and of reflection, the baby is able to form *general ideas* or principles of right conduct which will indicate what action he ought to take to meet adequately the situations he encounters later in everyday life.

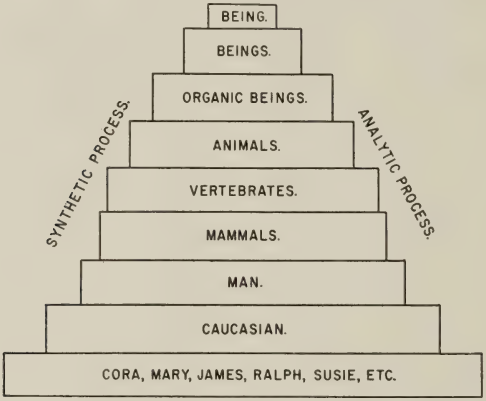


Fig. 57. Diagram of the thought pyramid showing how general ideas are built up from individuals, or particulars, by induction (the synthetic process), and are made to shed light on the nature of the individual, or particular, by deduction (the analytic process). (*After Joseph Baldwin, Elementary Psychology and Education,* 1895, *p.* 163.)

In Locke's opinion, ideas can be, and *ought to be,* derived in a logical manner from sensory experiences. We come by all our ideas through sensation and reflection, he said. We first perceive and feel, and then we think about what we have sensed and experienced. The perceptions, written upon the *tabula,* which originally was *rasa,* are remembered and recalled. Their persistence "enables the mind to *contemplate* them, to *discern* their similarities and differences, to *compare* and *distinguish* them, to *compose,* in imagination and fancy, their elements in arrangements not immediately given in sensation, and to abstract from them so-called general ideas." [1]

[1] B. A. G. Fuller, *A History of Philosophy,* New York, Henry Holt and Company, Inc., 1938, vol. II, p. 146. This is a summary statement based on John Locke, *An Essay concerning Human Understanding,* vol. I, chap. 11.

Faculty Psychology

In due time a group of educators known as the *faculty psychologists* seized upon Locke's identification of the several functions of the mind as evidence in support of their theory that the mind's work is carried on by separate powers, or *faculties*. There was thought to be a specific faculty of *observation*, by which the mind observes or gathers in the sense data; a faculty of *memory*, which retains or remembers them; a faculty of *reason*, which

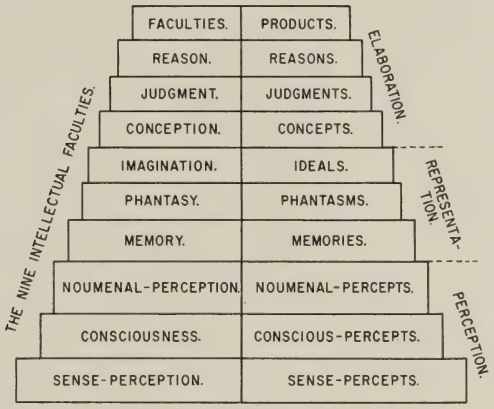


Fig. 58. Chart of the mental faculties and their products. (*After Joseph Baldwin, Elementary Psychology and Education,* 1895, *p.* 195.)

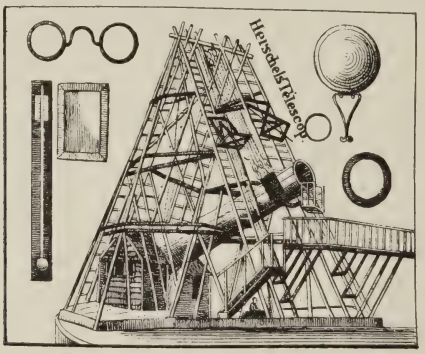
contemplates or thinks by means of the remembered data; and so forth. The faculty psychologists assumed, as Plato had centuries earlier, that the mind would be improved by proper discipline or exercise. Unlike Plato, however, these men held that each faculty must be trained or *disciplined* separately. The study of formal grammar and mathematics was thought to be especially valuable exercise or discipline for the several faculties, and the method of instruction undertaken to provide the desired exercise became known as *mental discipline*.

The theory that education is mental discipline was adopted quite generally by the secondary schools and colleges where the traditional Latin and Greek studies were entrenched, and it may be found in some of the same schools, as well as some newer ones, even to this day. Our present interest, however, is not in the faculty psychologists but in that group of

educators who centered their teaching activities upon helping the learner to accumulate the proper ideas of sensation and to form from them those ideas or moral principles which will lead to right action. Hence it is to Comenius, Pestalozzi, and Herbart that we must now turn.

Comenius

Among the earliest of the Protestant reform movements was one that appeared in Moravia under the leadership of John Huss. Like the Walden-



288.

Spiegel-, Augen- und andere Gläser.

Looking glasses, spectacles, and other glasses.

Les miroirs, les lunettes et les autres verres d'optique.

Looking glasses were invented, that people might see themselves.	[1] Die Spiegel sind erfunden worden, daß der Mensch sich selbst anschauen könne.	Les miroirs ont été inventés, afin que l'homme puisse se voir lui-même.
When the rays of the sun are compres-	[2] Wenn die Strahlen der Sonne eng zusam-	Quand les rayons du soleil sont concentrés,

Fig. 59. Sample lesson from a textbook which was a revision of one originally written by Comenius to impart knowledge through the pupil's sense organs. (*Courtesy of the Hartford Theological Seminary Foundation Library.*)

sians of central Europe, the Moravian Protestants experienced immediate and prolonged persecution. Nevertheless, their movement persisted even though the adherents were scattered; and it was a Moravian bishop, John Amos

Comenius, who early in the seventeenth century became a leading educational figure in Europe. Like other Protestant leaders, Comenius was interested in schools because he wished to make Bible reading available to large numbers. His purposes in educating, therefore, placed him among those who believe that knowledge of the good has been revealed. But his methods, and his broadmindedness in accepting guidance from sensory experiences in interpreting revelation, justify including him among the sense empiricists.

While he was formulating his educational theories, Comenius was strongly influenced by his belief both in the faculty psychology prevalent at that time and in the theory that knowledge is acquired through the senses. Properly trained faculties were thought to safeguard the individual from forming improper judgments about the ideas presented to him by the senses, which, incidently, Comenius called "the gateways to a man's soul." But, unlike many of the educators of his day, Comenius believed that the acquisition of sensory knowledge must precede the training of judgment, for, he said, it is only in this way that the pupil may learn to judge with understanding and good reason. To this end, he urged that the traditional Latin studies should be delayed until the pupil had finished six years of study in the vernacular. Furthermore, he sought to make these early years more fruitful ones by furnishing the pupils with textbooks which contained scientific information and which presented such information by means of pictures as well as by the printed word. He spent much of his time writing new textbooks, all of which reflected his desire to provide each pupil with the most comprehensive training in scientific knowledge that was possible.

Because of his interest in transmitting "universal wisdom," his plan of education was called *pansophia;* and it was his innovations in educational theory, curriculum, and methods designed to achieve this end that earned for him the status of a great educational reformer and a pioneer in the scientific movement in education.

Pestalozzi

Sense teaching was given a more direct form by the plucky but pathetic little Swiss schoolmaster Johann Heinrich Pestalozzi. Though his own schools ended in failure because he lacked the ability to manage finances, his insight into the professional aspects and his native generosity and devotion to his pupils led to the introduction of new practices which have influenced Western education until this day. Living during the days of the industrial revolution, he became deeply concerned about the lot of the children of the working class. It is said that in his native canton 1,500 people owned the factories in which 140,000 people worked for their living. This

ratio seems to have been rather typical, and the manner in which the many were exploited by the few—not merely in Switzerland but especially in the commercial centers of England, the Low Countries, and even America—is a dark blot on the history of the West, to say the least.

Like Rousseau, Pestalozzi rejected the belief in vogue for many years that the undernourished, neglected, and often mistreated children of the work-

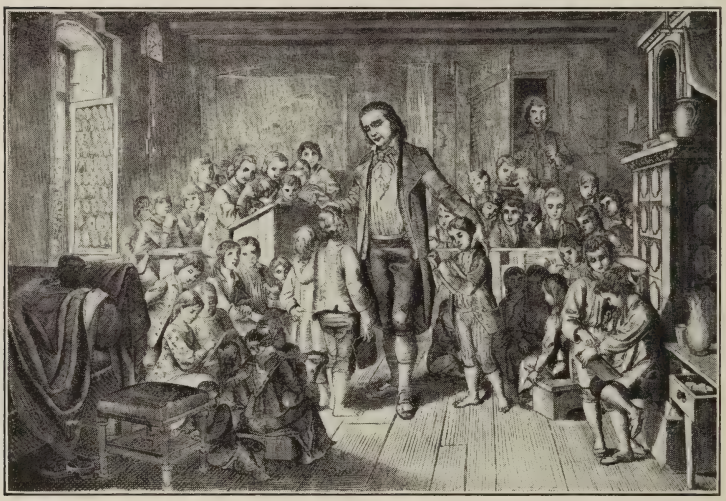


Fig. 60. Picture of Pestalozzi in his school. (*Courtesy of the Watkinson Library, Trinity College.*)

ing parents were by nature vicious and depraved. On the contrary, he said, these traits were developed in them by the unwholesome conditions which the greedy and shortsighted employers forced upon them. Pestalozzi believed that these children could be helped to grow into respectable men and women through proper training. His educational ventures were directed toward this end, and in this aspect they were impressively successful.

He also agreed with Rousseau that the educator must capitalize upon the inner, active forces of the child and that education should consist of giving these forces encouragement and direction. In this sense the child was regarded somewhat in the same light as a plant which needs proper cultivation and protection in order to realize its potentials to the full. It was this aspect of the theories of Rousseau and Pestalozzi which later impressed Froebel so strongly that he founded the kindergarten movement.

Proper nurture of the intellectual potential of the child, Pestalozzi reasoned, must be provided through sense impressions. "I find I have fixed the highest, supreme principle of instruction in the recognition of *sense-impression as the absolute foundation of all knowledge,*" he wrote, and on this foundation was built his novel approach to teaching. Commenting more fully in a report made in 1800 to a group of friends who had come to his assistance at Burgdorf, he wrote:[2]

> The most essential point from which I start is this—Sense impression of Nature is the only true foundation of human instruction, because it is the only true foundation of human knowledge. All that follows is the result of this sense-impression, and the process of abstracting from it. . . . And when I trace back all these elements of the human Art to their origin, I find it in the common basis of our mind, by means of which our understanding combines those impressions which the senses have received from Nature, and represents them as wholes, that is, as concepts.

Clearly evident in the above is Pestalozzi's conviction that concepts are derived from primary sense data, or *percepts*. For this reason he urged that the education of the young should be directed to the accumulation of the particular sense data out of which principles of right action may be formed. To this end he developed a method known as *sense teaching*. His procedure, especially with the younger children, was to take them on walks through the garden, the fields, or the woods. Stopping before a tree, a plant, or some other object he had selected for study, he would ask the children to note the color, shape, structure, and other characteristics. Each sense impression, experienced directly by one of the children, would then be described in a simple statement, as, for example, "The rose is red," or "The stem has many sharp thorns." These statements would then be repeated by all the children in unison, and when they had stated the major characteristics in this manner, each child was thought to have acquired the necessary sense data upon which to build some general understanding of the nature and use of the object.

Nature study and other activities that called for the manipulation of objects and materials, especially those involved in doing useful work or in making things, were used very extensively in Pestalozzi's schools. To this end, the older children worked in the gardens and helped with the household chores of the school. These activities were highly regarded because it was thought that through them the pupils would acquire many more sensory experiences of direct value in learning to know the world and man's proper role in it than could be acquired from reading or listening.

[2] Johann Heinrich Pestalozzi, "A Report to the Society of Friends of Education," quoted by Ellwood P. Cubberley in *Readings in the History of Education*. Boston, Houghton Mifflin Company, 1920, p. 441.

Though by means of his experimental schools and writings Pestalozzi succeeded in giving a new direction to the care and instruction of children, his influence in the educational circles of the West probably was greater in another way. The Prussian government had developed strong nationalistic ambitions and had decided to turn to education as a way of realizing them. A system of state-supported and -controlled elementary schools was established. These were staffed by teachers who had been trained in state normal schools newly created to give instruction in teaching methods borrowed in large part from those developed by Pestalozzi. The success of the Prussian school system soon encouraged other governments of Europe to establish similar systems. In fact, it was the Prussian model which caught the attention of Horace Mann and Henry Barnard, who, as we shall see later, were influential in bringing the new educational ideas to America.

Herbart

Early in the nineteenth century, the philosopher Johann Friedrich Herbart developed the philosophical and psychological foundations which played the major role in causing the emphasis in education to shift from that of mind training to the acquisition of knowledge originally derived from sense data. Herbart called the primary sense data *percepts*. The various percepts gathered by the senses were said to be assimilated and organized into systems of useful knowledge. The entire process of gathering and assimilating percepts Herbart called *apperception*. It is this apperceptive process which he said schools must control and direct if proper learning was to be achieved.

Learning as Apperception

For present purposes, it may help us to understand Herbart's theory of learning if we represent the mind of the learner as a fruit bowl standing on a shelf. The bowl has a hole in the bottom which is placed directly over a hole in the shelf. Let us also assume that the latter is equipped with a trap door that opens upward only. Thus objects may be pushed upward through the trap door and into the bowl but cannot fall back through once the door is closed. Since this is a "mental" fruit bowl, we may also imagine that when an object is within the area of the hole through which it entered, the bowl is aware of, or *conscious* of, the object. The area of the hole may therefore be spoken of as the *area of consciousness*. Once the object has passed through the opening and is located in the interior of the bowl itself, it is lost to consciousness and is said to be in the *subconscious*. However, objects in the subconscious region may be brought to consciousness again by having them reenter the area of consciousness. This happens, it

would seem, when we remember or recall something experienced earlier.

From this analogy, we may now discuss Herbart's explanation of how he believed the mind acquires knowledge. The senses, he said, transmit to the brain the impulses picked up from the environment. An impulse of this type is pushed into the mind's area of consciousness when it is *perceived,* that is to say, when the individual becomes conscious of the sensation for

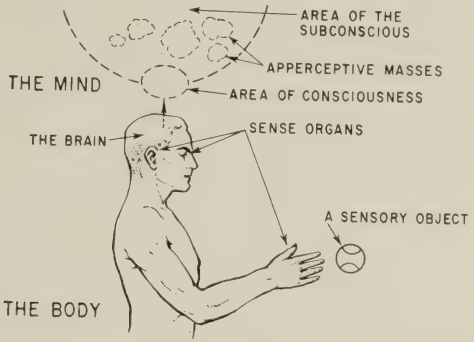


Fig. 61. Diagrammatical sketch of the apperceptive process. *Step* 1. Sensations originate in the sense organs from stimulation provided by the objects of the physical environment. *Step* 2. The sensory stimuli are transmitted from the sense organs to the brain by nerves. *Step* 3. The brain transmits to the mind, in some mysterious manner, the sensory materials it receives. These sensory materials must pass through the "area of consciousness," at which point the individual becomes aware of, or "conscious" of them. At this stage the sensory impulses are transformed into "ideas of sensation," or percepts. *Step* 4. After a brief stay in the area of consciousness, the percepts are lost to consciousness as they pass on into the "area of the subconscious." Here they join other percepts of their kind to form masses of related percepts or "apperceptive masses." *Step* 5. The several apperceptive masses may be recalled from the subconscious to consciousness in various ways, and organized, by rational process, into "ideas of reflection" or concepts. Such concepts are the "general principles of morality," which Herbart believed should be fostered through education because they will give moral as well as intellectual direction to the future behavior of the pupil.

a brief moment before the *percept* slips through the area of consciousness into the region of the subconscious. A process of assimilation or *association* was now said to take place. The new percept was not thought to remain as an independent entity in the subconscious; rather, it tends to become identified with other percepts of like kind which already are there as a result of previous learning. These associated percepts together were said to form an *apperceptive mass,* or mass of percepts.

The manner in which these associations are established among the per-

cepts came to occupy a substantial part of the attention of Herbart's successors, and from their efforts we acquired the beginnings of *association psychology*. Association psychology will be referred to again when we discuss the theories derived from E. L. Thorndike and John Watson. We should note, however, that for Herbart and his followers the associations were believed to be formed without the assistance of the central nervous system. The later schools of association psychology insisted that the associations are formed only by the aid of the central nervous system. More will be said on this subject in Chapter 17.

Returning to Herbart, we find that he agreed with Locke in assuming that the infant is born without knowledge and is therefore unconscious at the outset. The sense organs, however, are ready to function, and percepts begin to accumulate in the mind almost from the moment the child is born.[3] The apperceptive masses are built up from the particular sensory experiences a particular individual happens to encounter. For this reason, the particular kind of environment in which the child lives was thought to have a direct bearing upon the nature of his future conduct.

The direct relationship between what an individual *knows* and what he *does* was explained by assuming that the sense impressions of the present moment bring to consciousness not merely the factors inherent in the immediate situation but also the particular mass of percepts already in the area of the subconscious which is most directly related to the present situation. For example, if a child should meet a dog he will become conscious not only of this particular dog but also of all the dog experiences he has had before. His behavior with reference to this particular dog will therefore depend upon what he has learned about dogs in the past. A decision to act in a given situation thus need not be automatic and impulsive, but, by virtue of knowledge stored in the subconscious, it may be informed and intelligent. It becomes an intelligent act if a suitable body of information is brought from the subconscious to consciousness. By a suitable body is meant information that will enable the individual to judge the present situation in its proper light, that is to say, to act in accordance with knowledge of the universal laws of nature and principles of morality. Therefore, storing up proper masses of information in the mind of the child against his future needs became for Herbart and his followers the chief occupation of the teacher.

Herbart regarded the role of the learner as a passive one, at least as far as the school is concerned. He believed that the learner's mind will take in and store in the subconscious whatever the environment presents. This process of apperception was believed to go on whether or not the child is

[3] Freudians have made much of these early sense impressions which remain in the subconscious, sometimes to cause "mental" trouble in later life.

in school, and all individuals, whether or not educated, were thought to have accumulated a substantial store of percepts by the time they reach maturity. The educated person, however, was expected to have a supply of percepts so selected and organized that the resulting masses would enable him to make intelligent judgments. The uneducated, on the other hand, will have only random information which is not likely to be of much value in decision making. The orderly systems of knowledge possessed by the educated will point them to the moral principles that will give them direction and wisdom. Direction, moral principles, and good judgment were for Herbart the outgrowth of orderly information gathering. Thus, by giving attention to what the child perceives and by taking care that he builds proper associations between percepts, the school was said to be able to make him a more moral, intelligent, and fully effective individual than would be the case if his learning were left to chance.

Herbart's educational theory therefore consisted of two major parts, the one psychological and indicating how to teach and the other ethical and referring to what should be taught. The first part produced an educational methodology, and the second brought support to the already insistent demands for a new curriculum.[4]

Formal Steps in Teaching

The psychological basis on which Herbart constructed his theory of method was stated briefly as follows:[5]

> In order that a multitude of facts may be apprehended, explications or analyses are needed to prevent confusion; but since a synthesis is equally essential, the latter process may be started by conversation, continued by lifting into prominence the cardinal thoughts, and completed by the methodical independent thinking of the pupil: *clearness, association, system, method.*

The act of teaching, then, must take note of the four considerations given above. As a consequence, the complete act of teaching came to be thought of as consisting of these four stages or steps:

1. The facts involved in instruction in the present lesson must be made clear to the pupil.

2. The new fact or facts to be taught in the present lesson must be associated with the old information and ideas already within the mind of the pupil.

[4] For a more detailed account of these, see John Frederick Herbart, *Outlines of Educational Doctrine* Part I, Alexis F. Lange (trans.), Charles De Garmo (ann.), New York, The Macmillan Company, 1913.

[5] *Ibid.*, p. 53.

3. The old and the new must be organized into a new system or concept in such a manner as to have bearing on future conduct.

4. The pupil must develop the powers latent in the newly learned material by applying or using it.

Some of Herbart's followers came to distinguish *five* steps in the complete teaching act instead of the four above. The five steps and their relations to the above are as follows:[6]

1. Preparation—Analysis 2. Presentation—Synthesis	Apperception of percepts.
3. Association 4. Systematization	Thought, the derivation and arrangement of rule, principle, or class.
5. Application	From knowing to doing: use of motor powers.

This five-step teaching process ultimately came to be very widely used in American elementary schools. Many of the earliest classes for teachers and virtually all the American normal schools were established to train teachers to use this or a similar methodology. The author was trained in its use in his earliest courses in teaching.

The complete teaching act, as it was taught to the author, began with the teacher's efforts to bring to each child's consciousness the particular body or mass of percepts that had been selected for enlargement and reorganization. This was called the *preparation* step, and it referred to the preparation of the pupil rather than to any planning on the part of the teacher. Great stress was placed upon gaining the undivided attention of each pupil, for a slip here would make impossible the orderly assimilation and organization of what was to be learned. The importance attached to securing and holding the attention of the pupils in this step accounts in large measure for the strict discipline for which the teachers trained in the Herbartian tradition were famous.

When all pupils had been made attentive to the proper subject matter, the teacher *presented* the new material to be learned. This called for oral, visual, and even tactile presentations so that the sensory impressions would be as forceful as possible. Furthermore, the presentation needed to be made quickly, before the attention of the pupils could wander to other things.

The new material presented in the second step must be related to and compared and associated with the materials in the mass brought to consciousness in the first step. It was the *association* with and reorganization of the old materials in light of the new that was said to lead to systematic and orderly thinking and to make possible the formation of the general principles that were to have bearing on future action. The lesson was not

[6] *Ibid.*, p. 59.

completed, therefore, until a *generalization* or *systematization* had occurred. As the fourth step the teacher had to bring about the formulation of a general statement of the lesson's implications for future learning and acting.

In the fifth or final step, the generalization drawn in the fourth step was to be applied. In practice, the application step usually followed the formal part of the teaching and took the form of seatwork, busywork, or even homework. It was intended to help the pupil put his newly acquired learning to use. It ultimately led to the development of the project as a distinctive teaching device or form of learning activity. However, the application stage was not intended to add new knowledge, for it was thought best that this should be left to the personal direction of the teacher.

The Scientific Curriculum

Materials taught the pupil by means of the Herbartian methodology were believed to be retained indefinitely. The apperceptive masses formed when the materials presented to the child were assimilated and organized were believed to remain in the subconscious ready for use whenever the need might arise. It was entirely logical therefore that the second part of Herbart's contribution to educational theory was related to the materials out of which the apperceptive masses were to be formed. That is to say, he gave considerable thought to what should be the curriculum of the good school.

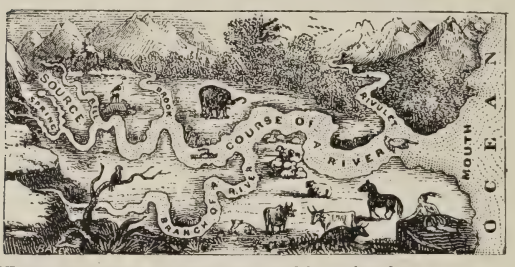
Herbart was quite critical of the great emphasis upon languages and literature found in the schools of his day. He was convinced that these subjects dealt only with the problems of the past and contributed little that might help in dealing wisely with the problems of the living generation. The real problems of living men, he said, arise from their dependence upon the existing physical and social environments. Right action, he held, can come only as men learn to know their environments, and particularly the laws which govern in them. As a sense empiricist, he held that such knowledge is acquired by scientific study and is recorded for use in the form of the various bodies of scientific knowledge.

The curriculum, Herbart came to insist, must be composed of the materials of the natural and the social sciences. Special attention must be given to the need to select from these sciences the facts, principles, and laws which will have most frequent and direct usefulness in later life. Physiology, geography, natural philosophy, botany, and kindred sciences now made their way into the classrooms. Since these bodies of scientific subject matter had generally been organized into logical arrangements to meet the needs of the mature scientist, the school subjects also came to possess the same rigid,

logical organizations. The child was now expected to master these formidable bodies of knowledge by proceeding from the simplest elements to the development of the most comprehensive generalizations, laws, and formulas. The study of physiology, for example, was made to begin with the defini-

LESSON III.

RILLS, BROOKS, RIVERS.



Q. What small streams of water are formed by springs?
A. Rills, Brooks, Rivulets, and Creeks.

Q. What do brooks and rivulets form?
A. They form larger streams of water, called Rivers.

Q. What are the large branches of a river called?
A. They are also called Rivers: small branches, Creeks.

Q. What is the place called, where a river rises or begins?
A. Its source; as, springs on high land, lakes, ponds, etc.

Q. What is the direction in which a river runs called?
A. The direction in which it runs is called its course.

Q. What is the place called where it flows into another body of water?
A. It is called the outlet or mouth of the river.

"He sendeth the springs into the valleys, which run among the hills. They give drink to every beast of the field."

Fig. 62. The emphasis on mastering the elements of scientific knowledge is apparent in this lesson (Lesson III) from an elementary geography textbook published in 1855.

tion of a cell, and the study of geography with the definition of the earth as a planet which rotates upon its axis and travels around the sun. To the modern teacher, neither the microscopic cell nor the macroscopic planetary system seems an appropriate starting point for the education of eight-year-old children, but the Herbartians apparently thought otherwise.

The New Schools

As we might expect, the traditional educational institutions, which now included the vernacular reading schools, the Latin grammar schools, and the classical universities, did not take kindly to the new subjects urged by Locke, Pestalozzi, Herbart, and others of the scientific tradition. In fact, these schools offered substantial resistance to the new learning, and it became desirable to establish new schools, which in due time came to form a complete, unified system that competed directly with the traditional school system on all levels.

In Europe, the traditional schools were highly selective and served only the elite. There were few if any schools open to the children of the poor. In the nineteenth century, sweeping changes were made. We referred earlier to the spirit of nationalism that swept through Europe late in the eighteenth century. Resourceful political leaders soon came to see education as a means for building a strong state. Thus, stimulated by the philosopher Fichte, Prussia built a national system of free schools which incorporated some of the Pestalozzian ideas. These schools were supported and controlled by the state. Attendance was required of all children six to fourteen years old except for those who were enrolled in one of the private, classical schools.

This new system of free schools provided an education for the children of the common people and tended in many places to replace the parish reading schools maintained by the Protestant sects. In addition to religion, reading, writing, and arithmetic, the curriculum of the *Volksschulen,* as they were called, offered instruction in the elements of science, history, geography, geometry, singing and drawing, and the German language. The objective clearly was to make the children of the common people efficient and proud citizens, capable of making their contribution to the success of the fatherland in times of peace as well as of war. To this end, history, geography, and singing, as well as the studies in the German language and literature, were designed to foster a feeling of unity and to instill pride in their country. The sciences, on the other hand, were meant to contribute to greater efficiency in agriculture, industry, and family life. Courses in agriculture, sewing, elementary nursing, and the handcrafts came to be offered to the older children. Also, gymnastics and physical training were added, partly to build stronger bodies fit for strenuous national service, but also to lay the basis for military discipline.

The thoroughness with which the Prussian leaders built the elementary school system without destroying the classical school system and the results

they achieved thereby made that system the model for many other states. One may still see in many European states traces of the two parallel systems of schools. The classical system is attended by the few who have ample economic means to pay the required fees and the social standing to gain admission. Quite separate from it is the system of free state schools controlled and maintained by the central government for the children of the masses. In some instances, the two systems are almost completely independent, and it is not easy for a child of poor parents to transfer to the classical schools and therefore gain admission to a university or to rise, by means of education, to a status above that held by his parents.

In America, the new scientific knowledge came to be sought by people in all walks of life. A popular demand for learning developed which brought on a rather phenomenal public school movement. In response to this demand, the Federal Congress as well as various state legislatures set aside lands and other forms of revenue to encourage the establishment of schools for the promulgation of learning. The now-familiar *elementary schools* made their appearance. They were so named because they were designed to teach *the elements* of the new scientific subjects. The academies and later the high schools were introduced to extend the opportunity to acquire useful knowledge on the secondary level. Finally, scientific and technical schools were established to extend the new learning to still higher levels. In 1862, Congress passed the Morrill Act, which provided for the establishment of the *land-grant* schools in each state.

Unlike the Europeans, the Americans were motivated to set up schools for personal reasons. The spirit of competitive nationalism which had brought about the state schools in Europe was not apparent here. Consequently, the initiative for establishing and maintaining new schools was provided by private individuals working together on the local level. The American schools arose from the grass roots as it were, and their control has remained local to this day.

Furthermore, the ends which the new schools were designed to serve were of a secular nature. The elements of useful knowledge were desired by everyone regardless of creed or economic status. Consequently, the new schools soon became public schools in the sense that they were supported by everyone and open to everyone. The requirements of a common school—that is, a school open to all—forced the withdrawal of religion as a subject in the curriculum. Thereafter, the secular schools, free to all classes and religious groups and offering the benefits of scientific knowledge to all, helped shape the drive for a democratic society. By the beginning of the twentieth century, an American child from almost any walk of life and living in any part of the country, might proceed from the local elementary school, through a high school, to a state college or university without having to pay a tuition fee.

Since that time, the public school systems in our several states have grown by leaps and bounds.

Teacher Training

Until 1700, little effort was directed toward preparing teachers in the strictly professional aspects of their work. The responsibility as well as the privilege of educating was delegated to the ecclesiastical authorities, and the highly restricted enrollments prevented the rise of any serious problems in keeping the schools staffed. Furthermore, it was generally believed that the successful completion of the usual program of academic subjects was preparation enough to teach, for it was believed that one who knows his subject matter should be able to teach it to others.

The development of the Pestalozzian and especially the Herbartian methodologies brought about a different attitude toward the subject of teacher training. Furthermore, the establishment of national systems of education in Europe created a demand for many teachers and for mass teaching methods. The children of the common people who attended the state schools were not to be disciplined in the Latin and logic which the graduates of the classical schools were prepared to teach. They were to be taught to read and write the national language and to know the facts and skills judged most likely to arouse a sense of national loyalty. Both the number of children to be taught and the nature of the new subject matter called for different teaching procedures.

The Pestalozzian and Herbartian procedures offered forms of mass education by which those facts and skills found in the new schools could be taught without unbearable expense to the state. Here were techniques that could be used to teach any of the new subjects, and the teaching technique could be mastered like any other vocational skill. The brighter young men and women of the working classes could be trained in the techniques of teaching without having to undergo the long-drawn-out process of earning the traditional bachelor's degree. Accordingly, teachers' seminaries and normal schools were set up and supported by the states. In them, well-selected young people were trained to teach in the new schools, and the training was given at public expense and in a relatively short time. The emphasis was clearly upon developing skill in the teaching techniques, and this emphasis soon produced a mechanized teaching procedure by which each lesson was to be taught in exactly the same way to all children at the same time.

Although no national system of education was established in America, the nineteenth century produced an enormous popular demand for schooling in the elements of the new learning. One-room elementary schools appeared

in the frontier communities with surprising frequency; often the school was established even before there was a church. Through the efforts of Henry Barnard and Horace Mann, information about the European state schools and particularly about the new mass teaching methods was widely circulated in this country. The promise of universal education inherent in the new methods led to the establishment of normal schools and teacher-training classes to prepare teachers to use those methods. Several German and Swiss educators were invited by the teacher-training institutions to come to America to help introduce the new methods. Charles De Garmo, the McMurray brothers, and others went to Europe to study the new education. They returned imbued with the principles of the Herbartian pedagogy. In 1892, the National Herbartian Society was organized, and in the wake of this movement the weight of leading professional opinion was thrown in support of what ultimately became a rather mechanical, formal teaching procedure or method.[7] Even today, there are relatively few among the older elementary school teachers who were not trained to use the five-step method developed from the Herbartian steps of clearness, association, system, and method which were described earlier. Most of the American normal schools came into being in response to the demand for training in the Herbartian technique, and many of the supervisory positions, especially in the larger city school systems, were originally created to make sure that the classroom teachers employed those techniques on the job.

Education for Research

This discussion of the effects upon the educational programs in Europe and America brought about by the scientific movement should not close without a brief reference to the importance that came to be attached to research. The establishment of a system of public schools, dedicated to the teaching of useful knowledge and free to all children, was a revolutionary development, to say the least. Moreover, the forces which brought about this development also worked important changes in higher education.

In Europe, the grammar schools which prepared boys to enter the classical universities enjoyed a virtual monopoly in secondary education for many centuries. Now, however, their curriculum had very little to offer in the way of useful information to the young men who aspired to careers in commerce and the new industries. New types of schools appeared as a consequence, and they made a strong appeal to the sons of the new middle classes. In some instances, the new schools were very similar to the traditional grammar schools except that they offered instruction in the modern languages

[7] Frederick Eby and Charles Flinn Arrowood, *The Development of Modern Education,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1941, p. 787.

as well as in the traditional Latin and Greek. Other schools concentrated upon mathematics and the sciences. But the graduates of these schools could not gain admission to the universities because they lacked the necessary degree of proficiency in Latin and Greek.

To meet the need for more advanced training in scientific fields, a number of higher technical schools were established, the most famous of which was the University of Berlin, opened in 1810. It was indeed a new institution of higher education. Enjoying public support, it was able to bring together on its faculty the most eminent scholars available in the German lands. It was by deliberate intent "a place where professors and students worked to discover truth, uninfluenced by any preconceived notions and unmindful of what older ideas might be upset in the process." [8] Here scholarship flourished, and research was elevated to the position of supreme importance. Berlin soon became the center for training in scientific scholarship, and from this university flowed a long stream of graduates who carried the new learning into other parts of the world.

The American intellectual atmosphere was particularly hospitable to the graduates of the University of Berlin. American technical and scientific institutes and especially the land-grant institutions eagerly sought men so trained. As the elementary schools, the academies, and the high schools took on the task of giving basic instruction in the elementary branches of science, the higher institutions were able to give greater attention to specialized training and research. Most of the land-grant institutions now became colleges or universities. Their undergraduate programs now offered a variety of specialized four-year curricula, and the successful completion of any one of these earned for the student a bachelor of science degree. In the wake of this development, great stress came to be placed by many people on the qualitative difference between the degrees of bachelor of science and bachelor of arts offered by the liberal-arts colleges, a distinction that is still maintained by many institutions to this day.

Graduate programs were developed by the universities to carry on specialization to still higher levels. A well-qualified graduate of one of the four-year programs could now engage in graduate study in a particular field of scientific inquiry. When he had demonstrated a thorough mastery of the knowledge available in his chosen field, and, even more important, when he had proved by means of a thesis study his ability to carry on research, he was awarded a graduate degree. The necessity of demonstrating competency to do research by discovering a new item of scientific truth is still the real purpose of the familiar graduate thesis.

[8] Ellwood P. Cubberly, *The History of Education,* Boston, Houghton Mifflin Company, 1920, p. 575.

Later Educational Developments

By the end of the nineteenth century, the sense empiricists had succeeded in establishing completely new systems of schools both in Europe and in America. Their desire to teach useful knowledge accounted for the unique characteristics of the new education. But as the several bodies of scientific knowledge were multiplied and expanded far beyond the limits which any given individual could master even in an entire lifetime, the question of which portions of the available knowledge should be taught came to plague the educators. From the necessity to select subject matter appropriate to the pupils in the several schools arose the curriculum movement, which reached great heights in America during the period between the two world wars.

We wrote earlier of Herbart's insistence that the curriculum of the new schools should consist of the natural sciences and the social sciences. However, Herbart provided no adequate basis for making a selection. One of the first to purpose a scheme for selecting the subject matter best suited to the needs of the pupils was Herbert Spencer. In an essay entitled "What Knowledge Is of Most Worth,"[9] he stated without reservation that the answer to the question of what subject matter should be taught is found in its *usefulness,* that is, in its ability to contribute to more satisfactory living. Commenting further, he said that knowledge may be judged suitable for the schools only if it contributes directly to living in at least one of the following ways:

1. To self-preservation
2. To making a living by making more productive and certain man's efforts to secure food and shelter
3. To rearing children
4. To maintaining proper social and political relations
5. To gratifying the tastes and feelings

Furthermore, he said that the degree of usefulness of each of the several sciences is indicated in the above order. That is, knowledge that contributes to self-preservation is of the utmost usefulness and should appear first among the things that are taught to children. Conversely, gratifying tastes and feelings is least important and should not take up the time of the school until the other matters have received proper attention. The logic of the sequence is obvious.

Spencer's line of thinking quickly gained great influence among the new schools. Physiology now came to be studied by children almost as soon as they were able to read. Its high priority was due to its supposed contribution to self-preservation. Next came geography, arithmetic, the natural sciences, and mathematics because of their bearing upon making a living.

[9] Herbert Spencer, *Education,* New York, A. L. Burt Company, 1862.

Then followed history, language studies, the social sciences, and other familiar "elements" of knowledge which were believed to help us get along with members of our families and with our fellow citizens. Domestic science, civics, and political sciences also made their appearance, and in time even such frankly marginal courses as art and music were found in some of the more progressive schools.

The Spencerian principles of scope and sequence seem to have enjoyed great influence for many years. In any event, no other pattern was proposed with comparable success until 1918, when a committee of the National Education Association offered the *seven cardinal principles* or objectives. According to the committee, the educational needs of the individual can be identified within the seven categories of health, command of the fundamental processes, worthy home membership, vocation, citizenship, worthy use of leisure, and ethical character.[10] The schools were therefore urged to provide instruction for each pupil in each of the seven categories. Where the Herbartian theory of learning prevailed, it was thought that this objective would be achieved most adequately simply by providing specific subjects in each of the seven categories. The curriculum problem became considerably more complicated, however, when the traditional concept of the Herbartian methodology was challenged by the introduction of the principle of *correlation*.

We noted earlier that the followers of Herbart attached great importance to the five-step lesson or teaching pattern. This had brought about the division of the school day into a series of teaching periods. Each period was given over to the teaching of a particular kind of subject matter. The length of the periods varied with the nature of the subject matter and particularly with the age of the pupils. In each period the teacher presented a predetermined amount of subject matter by means of the five-step technique; and in this manner each pupil took in his daily capsule of arithmetic, followed by a capsule of reading, of spelling, of geography, and so on, until each of the seven areas of learning had been covered. The next day the same pattern was repeated.

Since it was assumed that the pupils learned whatever the teacher presented to them, teachers sometimes prepared and administered each capsule of knowledge with but little thought to what was going on in the minds of the pupils. Disregard for the psychological effects on the pupils was apparently common enough even in Herbart's time to call forth a protest from him:[11]

[10] Commission on the Reorganization of Secondary Education, *Cardinal Principles of Secondary Education,* U.S. Bureau of Education, Bulletin 35, 1918.

[11] As quoted by Charles A. McMurray, *The Elements of General Method,* New York, The Macmillan Company, 1907, pp. 163–164.

I cannot refrain from wondering what sort of a process is being worked out in the heads of schoolboys who, in a single forenoon, are driven through a series of heterogeneous lessons, each one of which on the following day, at the regular tap of the bell, is repeated and continued. Is it expected that these boys will bring into relation with one another and with the thoughts of the playground the different threads of thought there spun? There are educators and teachers who, with marvellous confidence, presuppose just this, and in consequence trouble themselves no further

We are reminded that Herbart wanted instruction to lead to the formation of moral ideas as guides to right action. To him, proper ideas were derived from sensory data and were developed as the masses of percepts were built up. But if percepts were added without system and if little or no attention was given to developing suitable organization and relationships among them, no useful guiding principles would be produced. This, he felt, was the case when knowledge was spoon-fed to the children in fragments, such as those represented by the daily lessons. The difficulty, Herbart felt, grew out of the mistaken notion that the school had discharged its full duty when it had taught the prescribed bits of subject matter. He insisted that this was but half the process and that the neglected half, namely, the organization of subject matter into systems of knowledge that produce moral principles, was the more important half.

To bring the educative process into proper balance, Herbart and his leading disciples called for the teaching of the separate items of subject matter as integral parts of a unified system of knowledge. This doctrine became known in educational circles as the principle of *correlation*.[12] Though originally suggested by Herbart before the turn of the century, the correlation principle did not enter into the thinking of the curriculum makers with any appreciable effect until after World War I. Since that time there has been a tendency to rearrange subject matter so that it can be taught in large *units*. The units are generally so large that they occupy the attention of the learner over a period of several weeks. The work of each day within a given subject matter area is related to the central topic of the unit as a whole and, through the unit topic, to every other assignment in the unit. When the principle of correlation is applied within the area of a given subject, such as arithmetic or geography, the result may be referred to as a *unit of work* or a *teaching unit*. When correlation is attempted between subjects, as, for example, between history and geography, the educators are heard to speak of *correlated units, cooperative units,* and *fused courses*. When correlation

[12] For a more complete description, see I. N. Thut and J. Raymond Gerberich, *Foundations of Method for Secondary Schools,* New York, McGraw-Hill Book Company, Inc., 1949, pp. 193–201.

is attempted between in-class and out-of-class activities, there is much talk about *laboratory work* and *projects*.

The net result of efforts to correlate subject matter is, however, still a methodology by which it is hoped that more subject matter will be transmitted to more pupils in a given period of time. Thus, education employing unit methods to teach fused courses is still likely to be *subject-centered* as distinguished from *child-centered* and to proceed on the general philosophy of the sense empiricists that the good life will follow inevitably when people have acquired the right knowledge in sufficient quantity.

Influence on Modern Practices

Reviewing briefly the educational consequences that followed from the widespread acceptance of the philosophy of the sense empiricists, we find that a rather comprehensive educational reform had been brought about in Europe and America by the end of the nineteenth century. By this time, the sectarian domination of education, which had been so much in evidence among the earlier classical schools, had been replaced, especially in America, by public control and support. Confidence in the theory that knowledge would lead to right action had stimulated the establishment of free schools and the enactment of compulsory-attendance legislation. The extension of knowledge and the stimulation of scientific discovery had been made matters of public concern and had resulted in the establishment of state universities and research agencies. In this atmosphere, nothing less than a complete system of education, extending from the first lessons in reading to the systematic search for new knowledge, would satisfy the popular demand for learning.

The institutional results of that educational reform are in evidence today. The reading schools introduced in colonial days now have their counterpart in the primary grades of the elementary school. The elements of physiology, geography, history, and mathematics, which made up a large portion of the curriculum of the early elementary schools, are still taught in the intermediate grades, though the subjects have been reorganized, redirected, and frequently renamed. High schools have replaced the academies and the still earlier Latin grammar schools and have assumed not only the practical and terminal education offered in the older institutions but also the college-preparatory functions, including the elementary instruction in science and mathematics required for admission to scientific and technical colleges. We now also find the graduate schools, especially those of the land-grant colleges and state universities, preparing research workers and sponsoring important research in the interests of all the people. The agricultural experiment stations, usually operated in close cooperation with the land-

grant colleges, give further evidence of the research activities now carried on under public sponsorship.

In brief, the system of scientifically oriented schools now provides opportunities for study at all levels. With the addition of the land-grant colleges and state universities to the system of public schools, the opportunity to secure an education was placed within the reach of even the lower economic classes. The aspiration, first nurtured by the men of the Enlightenment, for a better world through the promulgation of true knowledge, has nowhere found a better instrument for its fulfillment than in the public schools of America.

CHAPTER 16

THE METHOD OF NATURAL SELECTION

By the end of the eighteenth century, both science and philosophy had become deeply involved in searching out the secrets of the physical universe. The Newtonian theory of a machine universe, a universe within which all change is determined by the unvarying laws of nature, had made a profound impression upon them. Within both fields of inquiry it was now assumed that mechanical necessity orders each physical object—even man himself—into its own appointed place in space and time. Furthermore, the regularity of the tides and the seasons, as well as the events observed in the celestial sphere, had led to the suggestion that all of nature points to a great cosmic system which is being maintained with relentless precision and determination. Man may learn about that system, and, indeed, his scientific and philosophical inquiries are directed toward that end, but he is powerless to change it in any way. His well-being therefore lies in learning its nature and in conforming to it.

The attitude which regards preceding events as having caused present events, which will, in turn, bring about specific consequences—all according to precise laws of succession—is known in philosophical circles as *determinism*. Its implications for scientific and philosophical inquiry moved Laplace to assert that a skillful enough mind would be able to calculate the whole of the past as well as the future history of the universe from a knowledge of the momentary configuration and velocity of the masses composing it.[1] Scientific inquiry, accordingly, became deeply involved in the effort to infer from observable phenomena the laws of nature and to express those laws as mathematical formulas which could be used in making further inferences and predictions.

[1] William Cecil Dampier-Whetham, *A History of Science,* New York, The Macmillan Company, 1930, p. 340.

Newton's Unchanging Universe

It should be apparent at once that precise predictions of future events can be made only if the system and its laws of operation remain constant and are fully known. The introduction of even one variable or the presence of one unknown factor will obviously invalidate any predictions which do not take them into account. This fact presented no difficulties to Newton and his followers, for they were convinced that the required stability was amply evident in nature. Along with orthodox theologians of that day, they accepted the doctrine of instantaneous creation based on a literal interpretation of the Genesis account of creation, which was thought to imply that the physical universe, as it exists today and always has existed, was brought into being in a single act of creation. Newton clearly stated his position in this matter: [2]

> All material Things seem to have been composed of the hard and solid Particles above-mention'd, variously associated in the first Creation by the Counsel of an intelligent Agent. For it became him who created them to set them in order. And if he did so, it's unphilosophical to seek for any other Origin of the World, or to pretend that it might arise out of a Chaos by the mere Laws of Nature; though being once form'd, it may continue by those Laws for many Ages.

Thus, to Newton, as well as to many of his followers, the universe was a finished creation within which events could be predicted with certainty. It remained only for men to discover the nature of that "order" into which the Creator has put things. The search for such knowledge was understood to be one of the most important duties of man, for, from such knowledge, he would be able to learn his assigned place in the natural order and thereby discover what God had willed for him.

An Evolving Universe

The technological developments which followed the introduction of deterministic thinking in the realms of astronomy and mechanics encouraged researchers in other fields to look for cause-effect relationships. Biologists were soon persuaded to abandon the theory of spontaneous generation, a theory which had been widely held for many centuries and which was used to account for the appearance of life under puzzling circumstances. The development of the compound microscope made available evidence which gave support to the theory that diseases are caused by extremely small living organisms. Fermentation and putrefaction were shown to be the results of

[2] Sir Isaac Newton, *Opticks,* reprinted from 4th ed. by George Bell & Sons, Ltd., London, 1931, p. 402.

bacterial action. Shortly thereafter, sterilization and immunization developed as new technologies by which to ensure and enrich human life. The emergence of physics and chemistry as two separate fields out of the older *natural philosophy* marked the abandonment of the ancient hope of the alchemists that base metals might be turned into gold.

The data which were accumulating as the result of these scientific inquiries soon introduced a new difficulty. Researchers in the field of biology, and especially embryology, found evidence that seemed to contradict the theory that each living organism is neatly identified with its own kind and is sharply differentiated from all other species. Furthermore, geologists and anthropologists began turning up evidence indicating that the students of Biblical literature might have been in error when they concluded that the earth had been created approximately 4,000 years before the birth of Jesus in Bethlehem. The remains of prehistoric animals and plants were found embedded in sedimentary rocks. The existence of the rocks themselves suggested that the earth had undergone changes which required countless centuries to bring about; and the fossilized remains of now extinct organisms imbedded in those rocks suggested that the inhabitants of the earth might also have undergone corresponding changes over the same period of time.

The age-old belief in the immutability of the species was also coming under suspicion as the result of the work of the early geneticists and practical agriculturalists. In experiments conducted both with plants and with animals, significant variations from type, as well as new varieties, were being produced quite consistently merely by carefully selecting the breeding stock. Naturalists of great distinction, including the eminent Lamarck, were led to suggest that structural variations were induced by environmental factors. Thus, it was said, the neck of the giraffe grew long because succeeding generations had stretched ever higher for the topmost leaves on the trees. Among Lamarck's four laws,[3] which appeared in his *Zoological Philosophy* and by which he sought to explain the great variation found among the members of a given species, were the following three:

1. New organs arise in response to new and reiterated wants and to the changes produced by these wants or by efforts to meet them.
2. The development of organs and their functions is determined by the use of such organs.
3. All changes in organization are conserved by generation and transmitted to offspring.

Clearly evident in the last of the above statements is the belief that acquired characteristics are transmitted to the offspring—a view which was widely

[3] As listed by W. T. Sedgwick and H. W. Tyler, *A Short History of Science,* New York, The Macmillan Company, 1917, p. 392.

held at the beginning of the nineteenth century but which later geneticists have repudiated.

Among other factors that were leading to the pronouncement of an outright theory of evolution was the discovery that from a chemical standpoint all living tissue, whether human, animal, or plant, is fundamentally the same. Furthermore, it was discovered that all tissue has a cellular structure and that the bulk of each cell consists of a common substance, which came to be called *protoplasm*.

The inference that all living matter is related now seemed unavoidable. Such a conclusion was made even more obvious by the work of the embryologists, who found that the structural relationships between species seem very close when they are compared during their respective embryonic stages.

Finally, a series of scientific expeditions undertaken early in the nineteenth century to remote parts of the world yielded a wealth of data showing an infinite variety of living forms, each form uniquely adapted to the climate, soil, and other factors peculiar to the place in which it was found. Clearly, not all these varieties were created in their present form and placed in the precise spot on earth where they were best suited to live by virtue of their individual peculiarities. Even if organisms and habitats had been so perfectly matched at the outset, subsequent geological changes, as indicated by the fossils and other signs apparent to the geologists, would have disturbed very substantially the original ideal arrangement. How, then, were present adaptations to the various environments to be explained?

Theory of Evolution

At the end of the eighteenth century, Robert Malthus, an English clergyman who had also studied economics, published the first edition of his *An Essay on the Principle of Population*. His work proved to be a potent one for it contained the view that "the human race always tends to outrun its means of subsistence, and can only be kept within bounds by famine, pestilence, or war, whereby the redundant individuals are eliminated." [4] Nearly forty years later, Charles Robert Darwin, a man of good background and education who had participated in a scientific expedition to the Pacific, happened to encounter this publication. By his own admission, the account given by Malthus of ways by which populations are kept in check immediately suggested to him the concept of a *struggle for existence* in which all living organisms are involved and in which *only those individuals best suited by their natures* to cope with the conditions that exist in their im-

[4] Dampier-Whetham, *op. cit.*, p. 295.

mediate environment *will survive* and reproduce their kind.[5] The essence of his theory is summarized in Darwin's own words as follows:[6]

> As many more individuals of each species are born than can possibly survive; and as, consequently, there is a frequently recurring struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be *naturally selected*. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form.

Implied in Darwin's statement quoted above are five basic factors which make up the process of natural selection.

1. Each species reproduces offspring in numbers much greater than its environment can support.
2. The offspring will vary, however slightly, with respect to such traits as size, coloration, strength, temperament, sensitivity, efficiency, and resistance to adverse conditions.
3. Owing to the environmental limitations on the supply of food, shelter, and mates, the individuals will be forced to compete with each other for the necessities of life.
4. Those individuals who chance to have traits which enable them to thrive best in their particular environment will produce more and stronger offspring than will the less fortunate individuals. Furthermore, these more numerous offspring will possess the same advantageous traits possessed by their parents. The less fortunate individuals, on the other hand, will weaken, and in time their line will die out altogether.
5. It is *nature* that determines which individuals will survive and, thus, what traits will be perpetuated.

The Good Is Relative

It is not important for us at this time to review the turmoil created in science, philosophy, and particularly theology by the publication of Darwin's thoroughgoing theory of evolution. Nor need we trace the important steps by which his views gradually worked their way into the intellectual attitudes of the Western world. It is important, however, that we take note of the implication that the creative act, far from having been finished in the early moments of time, is still in process. New environmental conditions are

[5] Charles Darwin, "Autobiography," *The Life and Letters of Charles Darwin,* Francis Darwin (ed.), New York, D. Appleton and Company, 1888, vol. 1, p. 68.

[6] Charles Darwin, *The Origin of Species,* New York, Appleton-Century-Crofts, Inc., 1915, vol. 1, p. 5.

therefore constantly emerging and will continue to emerge as long as the universe itself exists. As time moves on, new demands will be placed on all living things, including man; and new forms, both of organic life and of social institutions, will have to emerge to deal with them.

It follows from the above that physical adaptations, habits, social arrangements, and even standards of conduct derived from the past will not necessarily be *the good* we will require in the future. Thus, what was found to be good by one generation may actually prove to jeopardize the chances of future generations to survive and will therefore become not-good.

Clearly, then, *survival* becomes the test by which we may prove the good. As long as survival is the standard, forms and arrangements may be judged good or bad only in relation to the environmental conditions, both physical and social, in which they are to be used. In brief, the good is no longer to be considered as absolute but merely as relative to conditions which nature provides, and the search for knowledge of the good must continue without end as long as the universe itself is undergoing change.

Nature Determines the Good

It is also clear that the evolutionists did not picture man as a free agent. The good, though relative, was not thought to be relative to man's impulses or nature. Thus, they portrayed nature as the determining agent, and it is up to man to find out what is expected of him in his time and place. That is to say, man will enjoy the greatest good only when he is conforming fully to the particular conditions which nature has set for him.

The fact that nature and not man determines the course of the evolutionary process was thought to be clearly indicated by the records of history. Witness, for example, the generations of Western scholars who lamented the defeat of cultured, peace-loving Athenians at the hands of the brutal and uncouth Spartans. Also, witness how the organizing and administrating genius of republican Rome was usurped for selfish purposes by the tyrants and was ultimately destroyed by the uncivilized hordes that swept down from the north. We might readily infer from such events that humanitarian impulses and the refinements of the social arts which from time to time men have learned to cherish seemingly have had little if any survival value. They have not been able to stay the forces of evolution, and frequently those impulses and refinements have themselves been swept away. In light of this fact, so it is said, it is better to forget sentiment and antiquated ideals and learn to accept realistic ends.

It has been concluded from such evidence that the process of evolution is directed by some great cosmic force or intelligence. This sentiment was voiced even before Darwin by Lyell when he wrote: "Amid all the revolu

tions of the globe, the economy of Nature has been uniform, and her laws are the only things that have resisted the general movement. The rivers and the rocks, the seas and the continents have been changed in all their parts; but the laws which direct those changes and the rules to which they are subject, have remained invariably the same." [7] Though religionists were generally inclined to reject the theories of the evolutionists, believing that they contradicted the doctrine of divine creation, some came in time to see in the evolutionary process the hand of the Creator working out the details of His yet unfinished plan.

Whether or not evolutionists were motivated by pious impulses, they came to regard the processes of nature as relentless and irresistible. Mere man cannot stay them. What is to be will come about, for it has been determined by a power greater and presumably wiser than man. Man must, therefore, reconcile himself to the inevitable. Better still, he must learn to anticipate what is to come and to accept it as the good. Having done this, he will be in a position to adapt himself to the plan of nature and to help bring about what is called for. It is in this way, said the social evolutionists, that man may come to live the good life, for nature rewards with success those who fit into her plans.

Discovering Knowledge of the Good

Students of Western civilization point out that the idea of creation as an evolutionary process did not originate in the nineteenth century. Indeed, several of the early Greek naturalists had advanced theories very similar to some of those held by modern evolutionists. But these views had been lost along with other scientific and philosophical matters when pagan learning was banished from Christian Europe.

Speculations on the possibility of an evolutionary process appeared again when the Middle Ages merged into the modern period. Then, as the modern sciences were born, such philosophers as Bacon, Descartes, Leibnitz, and Kant turned to the possibilities of a continuing creation in their efforts to utilize and reconcile the new scientific information. But these early efforts seldom, if ever, entertained the possibility that the process of evolution might throw light on the question of what is good for man: what is good to believe, good to do, or good to have. In general, philosophy as the search for knowledge of the good continued to be held above and independent of the world of physical things and processes. The philosophical indifference to the physical universe which had been maintained for so long, was now to be challenged.

[7] Sedgwick and Tyler, *op. cit.*, p. 390.

The Hegelian Dialectic

The eighteenth century, we may recall, is known among historians as the Enlightenment, or the Age of Reason. It was a time when intellectuals were much given to manipulating ideas and to formulating ponderous systems of thought. Their unbounded faith in the methods of induction persuaded them that they were now able to discover knowledge of the good in its full and final form. To them, the good is absolute and unchanging, and, therefore, knowledge of it, properly derived, will always be valid for all peoples and at all times. At the end of the century, Georg Wilhelm Friedrich Hegel rejected this view and suggested that the object of which we seek knowledge, namely the idea of the good, is not absolute and static but is evolving. Hence our knowledge is not necessarily final but may merely be knowledge of a given stage in the evolution of the good.

Though Hegel lived and died before Darwin's *The Origin of Species* was published, the trend toward evolutionary thinking was already under way in his time. However, Hegel's inclination, like that of his immediate predecessors, was to focus his philosophical interest on ideas rather than on physical objects and processes. The possibility that the affairs of the physical universe are ordered and directed according to a cosmic plan or design had been inferred earlier from the new scientific discoveries, but Hegel now suggested that the plan itself is slowly taking shape in a sort of cosmic evolutionary process. The evolution of the cosmic plan, or *world idea,* as he called it, is what is meant by the *Hegelian dialectic.* Basic in this dialectical process is the concept of a given stage of the idea, called the *thesis,* opposed by its opposite, or the *antithesis.* Out of the conflict between the two idea forms, a single, higher idea form, called the *synthesis,* is said to emerge. The synthesis is now said to become a new thesis which arouses its own antithesis, and thus the process of bringing about a still newer synthesis is initiated.

The dialectic was for Hegel clearly one of ideas. As he stated it, "The metamorphosis can be ascribed only to the notion as such, because it alone is evolution . . . it is a clumsy idea . . . to regard the transformation from one natural form and sphere to a higher as an outward and actual production." [8] Nevertheless, Hegel believed that the various "notions," or ideas, bring about corresponding changes in the natural realm. Human institutions, especially nations, thus were thought of as physical manifestations of the evolving world idea; and the emergence of a new nation with its unique political forms and social innovations was interpreted as evidence of the achievement of a new synthesis. But just as the synthesis of ideas is achieved in a kind of conflict of ideas, so also is there real conflict, including physical

[8] As quoted by Dampier-Whetham, *op. cit.,* p. 293.

combat, between the nations which are their manifestations. Hegel believed that the study of history, especially as it reveals the conflicts between nations and peoples and the emergence of new national forms out of the old, would reveal to us something of the progress of the world idea as it is taking form in the dialectical process. To discover knowledge of the good, therefore, we must turn to history and infer from the continuing conflict of nations and peoples what the emerging world idea has established as the pattern for our times.

Thus, there is in the Hegelian dialectic the concept of a world idea slowly emerging from the caldron of conflict. It presents us with the picture of the good arising, step by step, from a competition of ideas. Each form that arises, even though it may enjoy the triumph of victory for only a brief period, must be accepted as the good for that stage because it has emerged as the new synthesis from the ongoing conflict.

For Hegel, this method for discovering knowledge of the good was to be used only within the realm of thought. He studied history only for the purpose of inferring from the record of nations in conflict the moral and ethical standards indicated by the process of historical determinism itself. He did not pretend to predict the particular form of government or the outlines of the social institutions which are still to come or which we ought to adopt for our future good. Rather he was inclined to be content with discovering standards by which to determine whether our present and past forms are good or bad.[9] Karl Marx, who was strongly influenced by Hegel, was not so reticent about claiming knowledge of the future good.

The Marxian Dialectic

In the Hegelian dialectic it was the nation—or, more precisely, the national idea—that was said to be engaged with a competing national idea in the struggle for supremacy. In contrast, Marx made the social classes the combatants in the dialectical process. Furthermore, Marx rejected Hegel's inclination to confine the struggle to the level of abstract ideas. In contrast, he pictured the struggle as one that takes place here in the material world and on the level of economic warfare, accompanied by all the blood, sweat, and tears of class competing with class for food, shelter, and a place in the sun. Hence, the dialectical process was, for him, strictly a *materialistic dialectic*—one that dealt with the hard facts of income and overhead, of purchasing power and living costs, of the distribution of industrial products, of the concentration of wealth, and of the ability of the economic system competing with other economic systems to gain the advantage.

[9] George H. Sabine, *A History of Political Theory,* New York, Henry Holt and Company, Inc., 1950, p. 625.

Marx read the history of peoples much as Hegel had read it but soon became convinced that the great world process was slowly grinding toward a *predetermined objective*. In reviewing the history of class competition, he concluded that each temporarily successful social system had achieved a somewhat higher degree of class equality than had any of its predecessors. Taking note of this trend—which, incidentally, he believed he had established beyond doubt by employing strictly scientific methods of study—he concluded that the evolutionary process *was determined to establish a classless society*.

The classless society then, was the Marxian "good." It was the ultimate and final good which the irresistible forces of evolution were thought to have as their undeniable goal. This was the ideal society which it was said—and still is said by modern Marxists—would bring an end to man's exploitation of man, to material scarcities induced by the greed for individual profits, to inequalities in the distribution of the world's goods, and even to warfare itself.

Marx also became convinced that the individuals trained to use scientific techniques to gather information about the class struggle and to draw inferences from those data would be able to discover detailed knowledge about the political arrangements and the social institutions and practices that would exist when the classless society would be achieved. Now, it was said, man could put that knowledge to use immediately in directing present-day political and social activity. If that were done it would be possible to speed up the evolutionary process. That is, if mankind were to adopt now, voluntarily, those institutions and arrangements discovered to be good by the dialecticians, even the present generation might be able to enjoy the benefits of the good life in its own time. And even if the people were unwilling to do these things for themselves, resolute leaders, by imposing the good arrangements upon the people, could bring about the good life much sooner than if the evolutionary process were left to run its own course. In either case the end results would be the same, and the ends would justify whatever means were necessary to achieve them.

Faith in the ability of the leaders to discover true knowledge of the good is the basis of the fanaticism so frequently displayed by the followers of Marx. They believe their method of discovery to be completely reliable because they believe it to be a thoroughly scientific one. It is thought to be scientific because it employs the precise mathematical techniques by which the physical scientists have successfully discovered the laws that govern physical change. In the hands of the dialecticians the same techniques are expected to reveal just as accurately the laws that govern social changes. Hence, the Marxian concept of the good life is thought by its adherents to have been *discovered*—not invented or constructed. According to the Marxist,

the classless society is what nature wants and, therefore, what the natural forces of evolution will bring about in due time, whether men wish it or not. It is because of their supposedly superior knowledge and supposedly superior ability to discover further knowledge useful in guiding the social revolution that the rulers of the modern Communist-dominated states are permitted to exercise absolute power and authority.

Social Darwinism

We must be very careful not to conclude that all or even the most important segment of *those who have adopted evolutionism* in describing social change *are followers either of the Hegelian or of the Marxian theories!* On the contrary, many of the social evolutionists find themselves in violent disagreement with the Marxian doctrine, especially because the latter hitched the evolutionary process to a predetermined goal or end. One such segment, known as *social Darwinism,* began with the work of Herbert Spencer, Walter Bagehot, and Ludwig Gumplowicz, all of whom lived and wrote in the nineteenth century. Spencer, who proposed theories of biological evolution even before Darwin, also taught that the forces of natural selection give direction to the evolution of social practices and institutions. Leaning strongly to the theory that nature selects and marks for survival only what is best suited to the conditions associated with that period, he called for the elimination of all regulation by government in economic and social matters. Only as man stops interfering with nature, he reasoned, will the laws of natural selection be able to exert their regulatory influence. This attitude found apt expression in the phrase, still popular in our own time, "That government is best which governs the least," an attitude generally identified as the principle of *laissez faire.*

Though differing greatly on a number of matters, including the laissez-faire principle, the social Darwinists in general have agreed [10]

1. That human society in all forms is a product of some sort of struggle for existence or survival;
2. . . . that the current development of social life and institutions is shaped by such a struggle;
3. . . . that natural selection operates in some way to determine survival;
4. . . . that survival is evidence of special fitness to meet the conditions of life;
5. . . . that man cannot change the method of evolution, cannot shape social development according to his own arbitrary concepts but must get in line with the forces of evolution and work with them.

[10] Chester C. Maxey, *Political Philosophies,* New York, The Macmillan Company, 1949, p. 618.

Here, too, nature is said to set the standards for man. Man is said to act wisely and to live well only when he conforms to nature. And since nature is thought to be an evolving rather than a static nature, the standards must be regarded as evolving also. Moral values, customs, and institutional forms must therefore be looked upon as products of the evolutionary process and are always to be judged in terms of their survival value. It follows that success comes to be looked upon as proof of the fitness of a particular form to survive and thus as proof of its goodness or badness.

The role which evolution was said to play in shaping customs and arrangements was described somewhat as follows. History shows that with the passing of the years civil and ecclesiastical authority have given ground in the face of growing demands for individual freedom, as in the eighteenth and nineteenth centuries. As a consequence, great variety has appeared in the ways people behave and in the social arrangements various social groups have adopted. The great variety in personal and social practices was likened by the social evolutionists to the overpopulation of living organisms which was seen to result in the biological struggle for survival. So also, it came to be said, do the modes of behavior and the institutions of men come into conflict with each other in their struggle for survival. The individuals and groups of individuals who happen to hit upon the most advantageous practices and arrangements come out ahead in the struggle. The values and practices they hold are therefore the ones that are perpetuated. Indeed, it may be said that they tend to become popular and that popularity is a kind of test by which we may determine what is good. The social evolutionists might say that it is in this way that the innovation or eccentricity of today may survive to become the custom of tomorrow, as was the case in the introduction and ultimate popular acceptance of the presently unavoidable sandwich and cocktail.

It is in the same type of competitive atmosphere that the modern states are said to have emerged. In the struggle for existence, the earliest forms of social organizations gave way to progressively stronger and larger states or groups of states. Looking ahead, the social Darwinist might now say that if the centrally controlled, strongly disciplined totalitarian state proves superior to its more loosely organized, less well-disciplined competitor, the latter will surely disappear from the world scene and be known only in history. The future of states, as well as of other types of social organizations, is therefore determined not on the basis of individual preferences or humanitarian considerations, save as these may coincide with the requirements for survival, but in the conditions of survival themselves.

Though the social Darwinists believed that man in the long run is impotent in controlling the evolutionary process, it was generally agreed that individual men or groups may improve their chances for success and survival

by adopting the practices and arrangements which nature apparently has selected to be rewarded. Hence, it was thought prudent to study the current scene with the view to discovering which individuals and social groups were enjoying the rewards of success in greatest measure. The successful business man, the public hero, the politician elected to office, and the man of great influence became the objects of the evolutionists' scientific study. Such inquiry was undertaken to learn what particular attributes and traits had won for the successful their favored status. Today, the states and social organizations which are exerting the greatest influence in the affairs of men are studied in similar fashion. Lists of the characteristics, traits, practices, and arrangements associated with success are prepared from such studies, and the items so identified are then recommended to others to be copied to improve their own chances for success.

It will be shown in the next chapter that during the first half of the twentieth century curriculum making was strongly influenced by the theories of the social Darwinists. As a consequence, the behavior patterns identified by research workers as those which contribute to successful adaptation came to join and sometimes to replace other types of curricular materials in many schools.

Statistics Aid Discovery

In a sense, the art of identifying the traits and practices used by the successful is essentially a method of "spying on our competitors." It may be practiced with varying degrees of thoroughness and precision by studying individuals either singly or in small numbers. But when large groups of individuals need to be studied, as when we wish to discover group characteristics or the principles and trends of social change, the method of study necessarily becomes a complex one. Tracing the past results or present trends of the evolutionary changes in which we ourselves are involved becomes to a considerable degree a matter of gathering vast quantities of numerical data and of analyzing them in a systematic manner. Statistics as a mathematical discipline have been developed largely as a tool for the systematic study of such data.

In the hands of the social scientist, statistics have become a tool of social research no less important than calculus is to the physical scientist. As statistical data have been gathered and analyzed with a view to formulating general principles regarding social change, the several branches of the social sciences have grown enormously. Though prediction in the field of social change admittedly has not been brought to a level of precision and dependability equal to that which exists in the physical sciences, the ability to identify trends has been improved remarkably. The social Darwinist

generally believes that the trends so revealed should be regarded as guides to the practices and arrangements that are to be preferred. Statistical studies should be undertaken, therefore, to discover what nature is selecting for survival in order that we may adopt those forms and thereby bring our own course of action into conformity. It is in this way that the knowledge discovered by observing the process of social evolution is said to be useful in directing men to live the good life in their own times.

CHAPTER 17

LEARNING TO SURVIVE AND SUCCEED

Though Newtonian science had accounted for change in the physical universe in terms of mechanical necessity, man and his behavior continued for some time to be regarded as exceptions to the rule. Man's unique status was explained by referring to the age-old belief in his special creation and in the power of his intellectual endowments to render him independent of the laws that govern all other things.

The doctrine of special status was clearly evident in the dualistic philosophy of Descartes. Physical man, he maintained, responds mechanically to physical stimulation just as the lower animals do. Touch his finger with a sharp instrument, and his hand will be withdrawn in a manner described as a *simple reflex*. Man, he said, is endowed with numerous reflexes of this nature which need only the proper impulses to set them off. In this respect, man is no different from the brutes.

Now, Descartes continued, let man bring his intellectual powers to bear upon the matter, and he can interrupt the reflex action in its course. That is, by taking thought he may prevent the usual action from following, or he may direct the impulse into an entirely different course of action. This the mind does, so Descartes insisted, by tipping the pineal gland, which is situated deep in the mid-section of the brain, so that the physical forces conveyed by the nerves will flow into whatever channel the mind has elected.

Clearly the process by which the mind or soul arrives at its decisions to direct the forces of the body into given channels was for Descartes something above and beyond the realm of natural law. True, it was conceded that certain ideas may be called up again and again by repeating the environmental situations with which they are *associated,* and given ideas may appear to have *connections* with other ideas; but the associations and connections were said to involve *ideas* and not merely material things. Though Hobbes,

Locke, Hume, and other speculative psychologists had taught that ideas are derived from sensations, ideas were still thought to be something other than the physical impulses from which they were said to arise; and their association in the mind was still said to be brought about not by a physical process but by a kind of "mental chemistry" governed by its own laws.

The process by which ideas, arising out of physical sensations, are compounded and enlarged was the central point of interest in the psychology of the sense empiricists. As such, it was discussed in Chapter 15. What is of special interest to us at the present moment is Descartes's suggestion that certain modes of human behavior, specifically automatic motor responses, are directly connected, *by physical structures,* to certain forms of environmental stimulation and that when the individual is stimulated physically the connected response will be made. This is the elementary principle of *reflex action.*

The Reflex-arc Concept

By the middle of the nineteenth century, physiologists and anatomists had laid the groundwork for a psychology based exclusively upon physiological processes. As early as 1740, Hartley had suggested that the stimulation of a sense organ induces a vibration in the brain. If this is followed immediately by a second stimulation, the two sets of vibrations become connected in such a way that when the first mode of stimulation is repeated later the resulting vibrations will call up the second set of vibrations without the aid of the second stimulus.[1]

Nearly one hundred years later, Sir Charles Bell discovered that the impulses picked up by the senses are relayed to the central portions of the nervous system by *sensory* nerves and that the impulses to act are carried to the responding mechanism by *motor* nerves. The differentiation of the sensory and the motor pathways helped to clarify the connecting role of the nervous system. Shortly thereafter, Helmholtz measured the speed at which the impulses move along the neural pathways, and Ernst Heinrich Weber demonstrated that there is a relationship between the intensity of the stimulation and the resulting sensory experience.[2]

These developments were augmented substantially at mid-century by the experimental studies conducted by Johannes Müller. Experimenting with frogs, Müller found that "reflex activity comprises three steps: (1) impulse

[1] Gardner Murphy, *Historical Introduction to Modern Psychology,* New York, Harcourt, Brace and Company, Inc., 1949, p. 33.

[2] For a more detailed account of these and other significant discoveries, see Edna Heidbreder, *Seven Psychologies,* New York, Appleton-Century-Crofts, Inc., 1933, chap. III.

from sense organ to nerve center via the dorsal root, (2) connection in the cord, and (3) impulse going out via the ventral root to the muscle." [3] Then, taking note of Bell's work, which had shown that impulses traveling along certain sensory nerves evoke only auditory experiences whereas other nerves transmit only visual, olfactory, or some other form of sensory experiences, Müller found evidence to support the theory of specialized areas in the brain. According to this view, the several kinds of sensory experiences depend upon the special areas in the brain in which the sensory nerves conducting

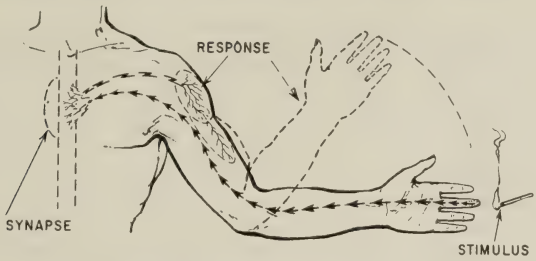


Fig. 63. Diagram of the neural basis of a reflex arc.

the impulses terminate. Thus, the area to which the auditory nerves lead evokes only auditory experiences, and the visual areas only visual experiences. It was concluded that if a sensory nerve leading from the eye was severed and then spliced to a nerve leading to the auditory area, an impulse originating in the eye would be "heard" and not "seen."

These and numerous other scientific investigations gradually led men to doubt the validity of the theory that man's intellectual powers are independent of the mechanics of natural processes. When Darwin published his theory of evolution in 1859 it seemed to many that man had at long last lost all claims to a special status. Not only his physical form but even his mental processes were now described as the products of natural causation.

Though the theory had not yet been fully developed, we can see from the above that by the middle of the nineteenth century the foundation had been laid for a *physiological psychology*. That is to say, it now seemed possible to account for some forms of mental behavior as well as for physical acts by assuming that the central nervous system somehow connects the factors that arouse behavior with the specific form of behavior that follows. The key to this physiological theory is the role played by the central nervous system. More specifically, it is the connection between a given sensory nerve and a

[3] Murphy, *op. cit.*, p. 93.

specific motor nerve which is established in a particular *synaptic area* that accounts for the behavior. The synaptic areas are areas in the central nervous system where a number of sensory and motor nerves terminate, thereby providing a kind of switch box where incoming nerve impulses may be routed along one of several possible channels. The synaptic connections are such that an impulse carried by a sensory nerve will automatically be transferred to a motor nerve, and the response that is controlled by that motor nerve will be given automatically. This is the concept of the *reflex arc*. The reflex arc is a fundamental concept in all the physiological psychologies of the present century, including the *connectionism* of E. L. Thorndike and the *behaviorism* of John Watson. It is these two schools of psychological theory which have exerted the greatest influence upon education since 1900.

Natural Selection and Habit Formation

As psychology came to rest more firmly upon a physiological basis, some research workers began to inquire into the reasons for behavioral reactions to environment. For example, why is a particular impulse routed to the particular motor nerve it follows rather than to one of the others available in the synaptic area? Or, why does a robin always build a robin's nest and never one that resembles the nest of an oriole or of a dove? Presumably it has the strength, dexterity, and physical structures that would enable it to build one of the latter types.

The causes of behavior had intrigued Herbert Spencer. He was led by his findings on the subject to conclude that there are two types of behavior, *reflexes* and *instincts*. In his opinion, reflexes are traces of the original nature of the particular species under consideration, whereas instincts are the results of the particular evolutionary process which that species has undergone. Instincts, Spencer concluded, are those ways of responding to the environment which have proved useful to the ancestors of the individual and, therefore, have been transmitted by them to succeeding generations. It must be remembered in this connection that Spencer believed quite firmly that learned or acquired characteristics are transmitted to the offspring. This belief, beyond doubt, had a considerable bearing upon his interpretation of the nature of instincts and their persistence from generation to generation.

Alexander Bain built upon some of the suggestions of Spencer to provide us with a clearer statement of the probable effect of environment on behavior. According to Bain, each individual is capable of responding in a variety of ways to a particular form of stimulation. This he does in random fashion. The responses he gives do not, however, produce identical results. Some of his responses are followed by pleasant consequences, whereas others

end in unpleasantness or discomfort. This theory brings to mind the struggle for survival the evolutionists say occurs whenever competing forms appear. In any event, the stimulated individual tends to select and retain the pleasure-giving movements, and at the same time he seeks to avoid those which result in unpleasantness. Those that produce pleasant consequences are repeated and thereby tend to become fixed as habits. As such, they will appear again and again, thereby giving the appearance of consistency and uniformity to the behavior of the individual under observation.

The pleasure-pain principle as the determining factor in the selection of forms of behavior was not original with Bain. It was pointed out in Chapter 14 that it had been a central principle in the philosophy of utilitarianism developed by Jeremy Bentham, James Mill, and John Stuart Mill. These men had taught that human behavior is motivated by self-interest and that the advancement of self-interest results in happiness or a general feeling of well-being. Furthermore, they had taught that modes of behavior and forms of physical and social arrangements which induce happiness are good. Hence, they had concluded that knowledge of the good might be discovered simply by taking note of the behavior and arrangements which result in the greatest happiness for the greatest numbers.

Now that Darwin's theory of evolution had become known, the pleasure-pain principle taught by the utilitarians came to be interpreted in terms of survival. The different modes of behavior were now said to persist or to disappear in direct relation to their contribution in the struggle for existence. Though a given form of response may yield immediate pleasure, it will nevertheless lose out to a competitor unless it also contributes directly to survival. In the ever present struggle for existence, nature rewards with success only those responses which she desires, not necessarily those which give pleasure to the individual. Hence, survival and success rather than pleasure and satisfaction became the hallmarks of the good to the evolutionists, and according to these standards, they claimed, both individual behavior and social custom are shaped and directed by the evolutionary forces.

Directing Habit Formation

Thus, as the nineteenth century was drawing to a close, the reflex arc and the principle of natural selection were coming to be used quite extensively in explaining both the nature and the evolution of human behavior. Also by this time, Wundt, Galton, Cattell, and others had introduced the techniques of scientific experimentation in the study of psychological problems. E. L. Thorndike, a young graduate student at Harvard, had begun his well-known experiments with chicks and other animals in his effort to learn

which types of behavior are instinctive and which are apparently learned. For the purposes of his particular study, he found it expedient to focus attention upon the simple acts of his subjects. These acts he described as specific, observable modes of response elicited by known and identifiable forms of stimulation. When the response repeatedly followed the stimulation, he assumed that they were connected. This is the *stimulus-response connection,* or *SR* bond, which is so familiar to students of psychology today. It is prominent because it is regarded as the simplest element of behavior, and upon it much of the current psychological theory as well as factual knowledge is based.

Until 1900, little had been learned which suggested that we might be able to control and direct the formation of new bonds. The credit for developing an acceptable explanation of how new bonds are formed, and a method by which to direct and control the formation of such bonds, belongs to the Russian scientist Pavlov. While experimenting with dogs, Pavlov discovered that when two separate forms of stimulation are made to occur in close succession the response normally elicited only by the second stimulus soon will come when only the first, or earlier, stimulus is presented. This process of establishing a connection between a stimulus and a mode of response which have not been so connected previously, came to be known as *conditioning*. The term itself suggests a physical process to achieve a mechanical relationship, much as we might speak of putting a radio in good working condition or reconditioning an automobile.

Here, obviously, was the basis for a workable theory of learning. When the principle of conditioning was coupled with the trial-and-error principle, the reflex-arc concept, and the pleasure-pain and natural-selection theories derived from Bain and others, psychology seemed ready to proceed on a thoroughly physical basis. Accordingly, educational psychologists turned to the study of how the conditioning process might best be used and controlled to fix the connections most desired by those who teach.

Though there are differences between the learning theories of the connectionists and those of the behaviorists, there also are many points on which the followers of Thorndike and Watson are in essential agreement. Both assert that the individual is equipped at birth with a variety of unlearned, native reflexes or native modes of responding to sensory stimulation. Indeed, both Thorndike and Watson spent considerable time in identifying and listing the unlearned modes of behavior. Furthermore, both agreed that the basis of such unlearned behavior is to be found in the central nervous system and consists of neural connections, many of which are already in existence at birth.

On this point, Watson wrote, "Certainly no structurally new pathways are found in the brain after infancy. Neural connections are largely laid down

at birth." [4] Watson went on to say that native or unlearned responses are not sufficient to equip the adult to live effectively in his time and place in the world. There are, however,[5]

> thousands of simple unlearned and unconditioned responses, such as finger and arm movements, eye movements, toe and leg movements, that escape the notice of all but trained observers. These are the elements out of which our organized, *learned,* responses must be formed and apparently by the process of conditioning. These simple, unconditioned, embryological responses, by the presentation of appropriate stimuli (society does this for us), can be grouped and tied together into complex *conditioned responses,* or habits, such as tennis, fencing, shoe-making, mother reactions, religious reactions, and the like.

At another point Watson asserted that by controlling the conditions of learning he would be able to provide any individual equipped with a healthy, normal body at birth with the habits, skills, and disposition necessary to achieve success in any designated field of endeavor.

It was Thorndike who, through his description of trial-and-error learning, exerted the greater influence upon educational practice. Beginning with the unlearned reflexes, instincts, and habits, as did Watson, Thorndike described the infant as capable of responding in a number of ways to a given stimulus. When the stimulus is first encountered, the responses will be given in some random order. This he identified as the *trial-and-error stage* of learning, which had been suggested earlier by Bain. Thorndike concluded that as long as the responses do not fit the requirements of the situation the learner will be annoyed and the stimulation will continue. Ultimately, however, a suitable response will come, and the stimulation will be terminated. This is pleasant to the learner, and the stimulation and the successful response will tend to become connected. The effect of pleasure and pain, of satisfaction and annoyance, in establishing connections was stated as the *law of effect.* Two other laws, the *law of exercise* and the *law of readiness,* were also advanced. The more enthusiastic followers asserted that the three laws of learning can account for the establishment of even the most complicated patterns of behavior, including emotions and involved mental processes, as well as the simpler motor habits.

As for education, Thorndike described the work of the teacher in terms of producing and preventing changes in the learner. "Using psychological terms, the art of teaching may be defined as the art of giving and withholding stimuli with the result of producing or preventing certain responses." [6] He delegated to the higher authorities of the school the respon-

[4] John B. Watson, *Behaviorism,* New York, W. W. Norton & Company, Inc., 1925, p. 24.

[5] *Ibid.*

[6] E. L. Thorndike, *Principles of Teaching,* New York, A. G. Seiler, 1906, p. 7.

sibility for determining what changes are to be brought about and which original tendencies are to be encouraged. This is the curriculum-making function. After the curriculum had been made by the higher authorities, it remained for the teacher to accomplish the designated goals with a minimum expenditure of time and effort and with maximum results. To this end he advised: *"Put together what you wish to have go together. Reward good impulses.* Conversely: *Keep apart what you wish to have separate. Let undesirable impulses bring discomfort."* [7]

In practice, such admonitions meant that the teacher should present, one at a time, the stimuli which the learner will encounter in life and then watch over the learner while he responds to those stimuli in terms of his unlearned impulses. The appearance of undesirable or undesired responses are to be punished and the desired responses rewarded. By repeating the process often enough, and by regulating the presentation of stimuli with due consideration for the learner's level of maturity, or readiness, Thorndike believed that a high degree of educational efficiency would be achieved.

Education Becomes Scientific

Under the combined influences of a physiological theory and scientific study methods, the psychologists of the new school were soon deeply involved in studying the problems of learning. Infants were watched and their reflexes tested with a view to learning which modes of responses are native and which are learned. The appearance of new modes of response were charted as a guide to readiness to learn. Basic drives and interests were identified and catalogued so that they might later be used to stimulate, or *motivate,* the learner. Complex behavior patterns were analyzed to discover the simple stimulus-response bonds out of which those patterns had been compounded. Experimental studies were undertaken to determine in what order and at what stage of maturity the several habits and skills involved in a specific type of learning, such as reading from a book or doing long division, could be attempted with the greatest expectation of success. Such efforts produced the grade-placement data by which the assignment of particular learning tasks to the several age groups was justified on *scientific* grounds. The sequence of learning within a given grade level also now was arranged with a view to the progression of difficulties which the scientific studies showed the learner experienced as he attempted to achieve mastery. Thus, the traditional arrangements of subject matter, which had been made on *logical* grounds, now gave way to new arrangements, which were justified on *psychological* grounds.

[7] *Ibid.,* p. 110.

Other studies were made to focus upon the operation of the laws of effect and of exercise. Thus, the relative worth of various forms of rewards and of punishments was determined. Among other things, it was found that whenever possible the learning situation should be so controlled that only the right response will be given in the trial-and-error stage. In this way, it will not be necessary later to break down undesired connections before the right one may be established. This principle has done much to eliminate the guessing formerly required when pupils were asked to spell a new word or to give the sum of an unfamiliar number combination. The frequency and duration of drill sessions also came under investigation, as did the time of day when such drill would yield the best results.

In brief, the data produced by the innumerable studies on the mechanics of learning and its proper direction soon reached monumental proportions. The normal schools, which had been introduced to provide prospective teachers with the techniques of their trade, now found it necessary to augment their modest offerings with scientific courses consisting of the newly discovered psychological materials. The two-year and even three-year training programs formerly found in the normal schools were expanded to four-year curricula. Most normal schools were changed to teachers colleges. Teachers now began to lay claims to professional status and to insist that they were *educated* in their profession and not merely *trained*.

The Pupil Must Be Active

Perhaps the most distinctive change brought about in the schools themselves was the new role assigned the pupil. We saw earlier how the Herbartian psychologists had identified learning with teaching. For them, the teacher was the center of interest in the classroom because they believed learning depended upon what the teacher did. Conversely, they regarded the pupil as the passive receiver who acquired without fail whatever subject matter the teacher dispensed in proper fashion. Now, as the mechanics of conditioning came to be understood, the roles played by teacher and pupil underwent marked changes.

It will be recalled from our earlier description that the physiological psychologists came to believe that learning begins when a new stimulus is encountered for which the learner has no suitable mode of response already established. This calls for random movement until a suitable response is given. Ultimately, that response will become established or *fixed* through repetition. When this occurs, it is said that a new habit has been learned. In the classroom it is the teacher who selects and presents the new stimulus to the pupil. But, no matter how carefully he may arrange the learning situation to ensure success, the teacher cannot supply the response itself.

Both the teacher and the pupil are dependent for the response upon the pupil's physical structure and nature. The pupil must give the responses, and no learning can occur until he does respond. Meanwhile, the teacher is forced to stand by, waiting to punish if the pupil makes undesired responses and to reward if he presents the desired response. To bring forth the desired responses, the pupil must *act*. Thus, "In the last analysis what the scholars do, not what the teacher does, educates them; not what we give, but what they get, counts; only through their self-activity are they directly changed." [8]

Teaching Real-life Habits

A second change was brought about by the general insistence that the habits formed in school must be those which contribute directly to better living. Attention was therefore focused upon the *real-life needs* of pupils, and the stimuli isolated for presentation in the classroom came more and more to be those which are encountered outside school. To reproduce real-life situations, changes were called for in the physical equipment of the classrooms and in the school buildings and grounds as well. Reading materials were selected and provided to give information and to answer questions about matters of greatest concern to pupils already engaged in the business of living. Arithmetic skills were practiced in miniature grocery stores. School governments were organized to provide opportunities to fix desirable social habits and controls under conditions resembling existing adult social arrangements. A full list of the transformations brought about so that pupils might learn to act properly in the situations they were expected to encounter in life has never been assembled and probably never will be. Certainly, it will not be attempted here. But curriculum studies made before World War II are very likely to refer to the *real-life needs* of the learners and to reflect this concern in many ways.

Individual Differences

Though Watson at first regarded all healthy, normal individuals as essentially equal at birth, at least with reference to their ability to acquire new habits, the evidence soon contradicted this assumption. Thorndike became interested in individual differences very early in his career and ultimately contributed greatly to our understanding of their nature and range. He was one of the first psychologists to employ statistical techniques in analyzing his data and thus was one of the first to discover the nature and

[8] *Ibid.*, p. 39.

range of the differences. The significance of his discoveries and their influence upon education were quite obvious to him. "The practical consequence of the fact of individual differences is that every general law of teaching has to be applied with consideration of the particular person in question. Every stimulus must be given not to men or to children in general, but to a particular individual or group characterized by certain peculiarities." [9]

One of the first types of differences to be measured accurately was that of individual capacity to learn. Data on this trait became available as a result of the development in France of an instrument that measures general capacity to learn by taking an inventory of what has been learned over a fixed period of time. This instrument, as constructed by Alfred Binet and refined and adapted to American conditions by L. M. Terman, of Stanford University, was soon in use in virtually every center where educational and psychological research was being conducted. The instrument is still familiarly known as the Stanford Revision of the Binet Intelligence Scale.

The differences in individual performances noted by the research workers soon came to be explained in terms of structural differences in the nervous systems of the individuals themselves. Thus, some individuals were thought to have very complex nervous systems, rich in existing as well as potential neural connections, and by nature easily modified. Individuals so equipped were thought to learn very quickly and in great variety. Such individuals were said to have a high capacity to learn, or to be of high *intelligence*. Individuals not so well equipped physically were said to learn more slowly and within narrower limits. That is, they were said to have relatively lower intelligence. Since the differences were said to be due to structural differences, it was assumed that intelligence, defined as the capacity to learn, is inherited and that as an inherited trait it remains constant throughout life.

The need for differentiation in treatment by the school to match the differences in the abilities of the pupils now seemed undeniable. The slow learner not only was shown to fall behind his classmates in acquiring the required behavioral patterns within the usual time allowed but also was found to have lower limits with reference to the number and the complexity of habits he could master regardless of the time allowed him. Obviously, therefore, his ultimate destination in life must be one which would place relatively few demands upon him in the form of habits, skills, and factual knowledge. His educational needs, therefore, would be quite different from those of the better-equipped pupils, and corresponding adjustments would be called for in his curriculum. Modified programs of study, which frequently gave considerable attention to motor habits, were developed for the slow learner, just as programs rich in verbal, conceptual, and complex so-

[9] *Ibid.*, p. 83.

cial relationships were provided for the gifted. Homogeneous groups arranged on the basis of intelligence-test scores replaced chronological age and grade-achievement groupings. Since emotional factors were found to play an important role in conditioning, attention was given to the pupil's emotional needs. It is partly for these reasons that school marks came to be based on group standards instead of absolute standards. That is to say, letter grades replaced numerical or percentage grades in nearly every school and college in the country.

Guidance

As differentiated curricula were introduced to prepare students for specific adult callings, it became increasingly necessary to help each pupil find the particular educational program best suited to his needs. Furthermore, the interest in individual differences developed by the psychologists soon led to the development of a variety of instruments with which to measure a number of personality traits in addition to intelligence. A number of special aptitudes—motor, social, academic, and artistic—were identified, and their relation to success in school as well as in vocational and recreational pursuits were studied. In time, some investigators came to believe that it is possible to predict quite accurately the potentialities of a given individual in a specific field of endeavor by means of the information obtained from such test data.

Motivated by the desire "to put the square pegs in square holes and the round pegs in round holes," schools now began to employ persons specially trained in the administration of aptitude tests and in the interpretation of the test data. It became standard practice in many schools to test each pupil and to assign him to the educational program indicated by his test scores. Unfortunately, some of the guidance people became overconfident regarding the validity and dependability of their data and were sometimes accused of employing dogmatic practices even to the point of coercing pupils against their wishes as well as the wishes of their parents. The intent, however, was clearly that of directing each pupil into the walk of life for which he was *best suited by nature*. It was insisted that *nature,* and not the school or the guidance counselor, had marked the individual for his station in life. The instruments, it was said, merely enabled the individuals concerned to discover the pupil's niche in life with a minimum of fumbling and failure and to provide a program of training designed to prepare the pupil to fill his optimal place. That is to say, both the individual and society would be benefited in the long run if the individual would only follow the evidence discovered by means of the instruments.

Curriculum Building

Thorndike concluded very early in his career that all human beings have essentially the same basic needs.[10] Changing physical and social conditions, however, require men to employ different means to satisfy them, and, as a consequence, there will be considerable variation in the individual behavioral patterns. Individual differences will also account for varying degrees of success among the members of a given generation or group as they struggle to satisfy their basic drives. But, it was now concluded, a given individual may achieve a level of success somewhat higher than the one he would otherwise achieve if he is trained to go about his affairs in the ways discovered to be best by the more gifted individuals. That is to say, a society can employ an educational program to give every member of the coming generation the advantages discovered and enjoyed by the most gifted among the present adults. Furthermore, a society which does this will presumably become vastly better and stronger than if these matters are left to individual trial and error. Humanitarian motives as well as considerations of self-preservation therefore require societies to educate their young. Such considerations also require that utmost vigilance be exercised in determining what is to be transmitted. In reference to this matter of discovering what should be taught the young, it came to be believed that attention to the principle of natural selection would pay handsome dividends.

We learned in the preceding chapter that the principle of natural selection means that nature rewards with success those individuals who best conform to the particular conditions which she sets before them. Success and even survival are achieved only by adapting to the existing physical and social environment. It is here that the individual differences demonstrate a survival value, for those individuals who conform best to nature's demands will become recognized as successful people and will generally enjoy above-average rewards in the form of material wealth, social prestige, and personal advantage. It follows that their patterns of adaptive behavior should be imitated and that those patterns should be fixed upon the young by employing the techniques of conditioning.

Scientific curriculum development, especially as conceived by Charles H. Judd, W. W. Charters, Franklin Bobbit, and many of their students, had as its purpose the identification of the types of behavior best suited to afford advantage in the struggle for existence. Judd wrote:[11]

[10] See especially Edward L. Thorndike and Arthur I. Gates, *Elementary Principles of Education,* New York, The Macmillan Company, 1929, p. 7 and chap. III.

[11] Charles Hubbard Judd, *Introduction to the Scientific Study of Education,* Boston, Ginn & Company, 1918, p. 200.

The characteristic fact about the present generation of progressive educators is that they are undertaking certain studies which are designed to hasten the processes of selection. The curriculum is to be modified and improved, with every new accession of knowledge and with every new evolution in social life. . . . It will be noted that there is no opposition between the natural tendencies of growth and revision and the special investigations which are intended to hasten the process of adjustment. The purpose of scientific studies here, as in every other sphere, is to facilitate natural evolution and to give it rational guidance.

A scientific technique highly regarded by these curriculum makers was the one by which they systematically analyzed the habits, skills, and facts used most frequently by the most successful living adults. The technique was based on the assumption that the items of information, the habits, and the skills found to be used most frequently by these individuals had directly contributed to their extraordinary success. Those particular items were thought to be in most frequent use by the successful because they were best suited to the particular demands peculiar to that time. In brief, those particular facts, habits, and skills were looked upon as the survivors in the current struggle for existence and, therefore, as the ones which would prove most advantageous to the generation in school at that time. The technique used to make such studies came to be called *factor analysis.*

As a result of such studies, reading vocabularies were revised, words that were no longer in current use were dropped from spelling lists, and arithmetic problems which no longer had practical application were eliminated from the courses of study. In their place were substituted new materials found to be used by successful adults. Similarly, the errors made by the pupils in speaking or writing were noted, and instruction was provided to help them substitute correct forms. Functional grammar came to replace formal grammar in the schools, and the emphasis was shifted from the formal and academic to the practical and specific aspects of education in all areas of the school curriculum.

To this end, curriculum studies also frequently resorted to the use of the *follow-up technique,* in which, by means of questionnaires or personal interviews, information was secured from those who had left school, either through graduation or withdrawal, regarding the relationships between their school studies and their present on-the-job requirements. The types of work now engaged in by the school-leavers were noted, and training programs were introduced to prepare pupils in school for those types of activities in which the school-leavers were found to engage in most frequently. This technique also contributed to making instruction center upon what was assumed to be the real-life interests and needs mentioned earlier in this chapter.

Educating the Gifted

The free play the evolutionary forces were expected to enjoy in shaping the curriculum of the schools should be apparent from the above account. In brief, it was said that the changing environment, both physical and social, determines the nature of the pupil's educational needs. Natural selection, by differentiating between the successful and the less successful, designates the best ways to cope with those needs. But as long as we must wait for natural selection to point out to us the preferred forms of adaptation in the present generation of adults, our schools will always be one generation behind schedule. That is, the adults who are successful today are successful because they have adapted themselves to today's environmental demands. The children in school, however, must conform to the conditions that will exist twenty-five years from now.

The schools are thus presented with a most difficult problem. It would seem that the schools must anticipate both the state of the world twenty-five years in the future and the particular facts, habits, and skills that will provide the greatest survival advantages at that time. An easier solution was suggested by a few enthusiastic evolutionists.

It will be recalled that, in describing individual differences, the gifted individuals were said to be endowed with the ability to establish new habits more rapidly than the less gifted and to respond to a given form of stimulation in a greater number of ways. Because of their ability to learn more rapidly, the gifted were sometimes segregated from the others in order to provide them with instruction suited to their greater capacities. It now occurred to some educators that the gifted are the *natural* leaders of their generation and should be so regarded by both society and the schools.

To this end, it was suggested that the gifted pupils, identified from their aptitude-test scores, should be put through the usual training programs as rapidly as possible and graduated from school as soon as they have satisfied the usual requirements. Because of their early graduation, it was expected that they would be called upon to cope with the problems of their day a few years ahead of their own age group. Because of their superior ability to acquire new modes of adaptation, they would discover very quickly the best ways to deal with the needs of the day. Other members of their own age group would then need merely to imitate the gifted and thereby avoid the costly and sometimes disastrous hazards of resorting to their own less promising trial-and-error efforts. Thus, the gifted would be the leaders of their own generation in a literal sense of the term and would fulfill their leadership responsibilities by pioneering new skills and behavior patterns for their own age group.

Meantime the schools would be conditioning the less gifted in the ways of "followership." In addition to acquiring the habits, facts, and skills of their probable form of socially useful work, the less gifted were to be taught to recognize and look up to their natural leaders. They were to be conditioned to have interests and emotions which would make them satisfied with a subordinate status and to accept without rancor the guidance of their superiors. We may observe in passing that this view has not become popular among people who are disposed to look upon human nature and personality as capable of improvement and development. More will be said on this subject in Part IV.

There is, of course, much that remains unsaid about the change that came in the field of education with the introduction of philosophical and psychological principles derived from the theory of natural selection. Current professional literature is filled with discussions both of the basic theories involved and of their application in the field of school teaching. Enough has been said here, however, to indicate that major changes came about in the techniques and methods of teaching as well as in the content of the educational offering. New developments in the curriculum area have been especially prominent in recent years, as indicated by the great variety of programs of instruction now found in our secondary schools, each of which is designed to equip the learner with the unique behavioral patterns associated with a specialized vocational field. In this connection, courses in printing, office practice, stenography, grooming, budgeting, and other groups of specific habits, facts, and skills were added to the curriculum to prepare students for efficient participation in particular types of out-of-school activities or employment after graduation.

The schools have also ventured to classify and group pupils on the basis of their native endowments, sometimes at an early age.[12] If objections have sometimes been raised on the grounds that these practices, *when accompanied by limitations in subsequent opportunities,* run contrary to the democratic right of the individual to shape the course of his own life, the objections have generally been met with the argument that it is *nature* and not the school which determines for the pupil what is to be his proper place in the world.

[12] The English Education Act of 1944 originally provided for national examinations to be given all children at the age of eleven. Their subsequent educational opportunities, and hence their economic and social opportunities, were to be determined to a large degree by their scores in these examinations. In general, the European systems of education have been more inclined than have American schools to identify and separate the different ability groups at an early age.

STUDY AND DISCUSSION PROBLEMS RELATED TO PART III

1. Inquire into the origin of the terms *transcendent* and *immanent* as they are used in philosophy and theology. What significance did these terms have in the political and social theories developed by Europeans and Americans of the eighteenth and nineteenth centuries?

2. Martin Luther and Desiderius Erasmus were personal acquaintances and close associates in their earlier years. Discuss the differences which later separated them on matters philosophical and theological. How did these differences produce different ways of putting their theories to work?

3. The eighteenth century is frequently referred to as the Age of Reason or the Enlightenment. List the major literary figures of that century and the most important works of each. What were the issues they debated? How did they derive the arguments they prepared? Who opposed them and for what reasons?

4. Review the medieval arguments about the acceptability of Aristotelian philosophy in theological circles. How many of those arguments, both pro and con, are still in circulation today?

5. Inquire into the system of civil service examinations employed in England, France, or Germany before 1915. What was the relationship between the examinations and secondary and higher education? What philosophical assumptions do you infer from the relationships?

6. After Newton, certain philosophers were inclined to refer to God as the *First Cause*. What was meant by this term and how did it fit in with Newton's description of physical events? With later theories of scientific determinism?

7. Read Erasmus on the subject of language studies in the schools of his day. Then read Herbert Spencer on the same subject. How many of their arguments are heard on this subject today? Which of these arguments do we regard as valid today?

8. Inquire into the curriculum of the schools of Russia today. How do the subjects taught reflect the basic communistic philosophy? In light of what kind of knowledge are Russian children taught that decisions must be made, and how is that knowledge derived? What specific knowledge commonly taught in our schools is omitted in Russia? Explain these differences.

9. What do the terms *economic determinism* and *historical determinism* imply with reference to man's ability to discover knowledge of the good? What do they imply with reference to the tools and methods for discovering such knowledge?

10. How is the trial-and-error theory of learning related to the theory of natural selection? How does social trial and error lead to social customs and mores? According to this view, are moral values man-made, or are they the product of a process over which man has no control?

11. Develop a test for Part III by formulating a list of true statements (seventy-five or more) describing aspects which characterize each of the three methods by which it has been said that men discover knowledge of the good. Arrange these statements in random order and ask members of the class to identify each statement by indicating the method for discovering knowledge with which it is most closely related.

Examples:

a. The best indication of potential leadership ability is a high intelligence-test score (the method of natural selection).

b. Education in the natural and social sciences of greatest use to mankind must be available to everyone (the method of the sense empiricists).

c. Discovery must begin with premises known to be true on authority (the method of deductive reason).

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Part IV

THE THEORY THAT KNOWLEDGE OF THE GOOD IS CONSTRUCTED

CHAPTER 18

BACKGROUNDS OF THE THEORY THAT KNOWLEDGE IS CONSTRUCTED

A determined effort was made in the early chapters of this book to define philosophy as man's search for knowledge of the good. It was shown that the good has meant different things to different people at different times. But it was also shown that in each instance knowledge of what was said to be good was deliberately sought because it would enable men to live better lives than they could hope to live if they continued in a state of ignorance.

Knowledge of the good, therefore, has had reference to whatever may enhance the dignity of man and contribute to his well-being, both material and spiritual. Each system of knowledge has pointed not merely to the things men should believe and revere but also to the things they should possess, the arrangements they should make, and the ways they should act.

To this point in our discussions, there has been no deviation from the definition of philosophy as a search for knowledge of the good, and there is no intention of deviating from it now. In all that follows, we shall continue to assume that philosophy, as well as its handmaiden education, must make a difference in the way men live and in the consequences in experience which they have. If philosophy cannot or will not make such a difference, it deserves to be regarded merely as an idle amusement.

The systems of knowledge reviewed to this point were quite clear in this matter. Did not Plato say that the advantages of the ideal state are available only to those who will submit to the rule of philosopher-kings? Were not the Holy Roman Empire and the Calvinist state fashioned along lines claimed to be superior because their knowledge had been either derived from natural law or given in divine revelation? Did not the rationalists teach that reason is a better way of learning to know the will of God, especially in matters temporal, than is the method of faith? Did not the scientists of the

eighteenth and nineteenth centuries support their claims to superior knowledge by pointing to the technological improvements their knowledge helped them bring about?

The time has come, however, when large groups of individuals say that none of the preceding ways of knowing is good enough for man's present needs. Though each way in its time may have alleviated some abuses and opened the door of opportunity to individuals who had previously been oppressed, not one of those ways is now able to accommodate all who aspire to live the good life. As a consequence, a new philosophical attitude has emerged, and a new way of knowing is now urged upon us. The justification of that way of knowing, it is claimed, lies in its potential for making possible a richer and more satisfying life for everyone. We shall now review some of the developments which have contributed to the emergence of that new philosophical outlook.

Authoritarianism in the Preceding Theories

Most of us have been reared in a social atmosphere characterized by the principle of popular government. We have learned to be proud of our traditions of individual freedom and equality and of our personal responsibilities for determining the kind of society we have. We say that ours is a land of opportunity in which status is determined more by individual preference and initiative than by the conditions of birth. We hold especially high that aspect of our social philosophy which expects progressive improvement in the well-being of all individuals and which makes such improvement the direct and immediate goal of our common life. Change in our kind of society is directed by the principle that the individual knows best what is good for him—knows that good better than anyone else can know it—and our social arrangements have been designed to make it possible for him to act on the basis of his knowledge. In our society the individual is supreme, and our institutions and laws are subject to his will.

Obviously, this was not the case in the social systems we have reviewed to this point. In each society, based on knowledge said to have been either received or discovered, the status of the common man was a subordinate one. In every instance the good which men must know was said to be hidden beyond the reach of ordinary individuals and to be available only to a select few endowed with special gifts for knowing. Denied the ability to acquire knowledge of the good for himself, the common man was made to depend upon the knowledge provided by the few. Thus, the few became established as the *authorities,* and they acquired the *authority* to make the laws and to shape the political forms and social arrangements by which

their version of the good life could be imposed upon everyone, always with profuse arguments to support the claim that everyone, the lowly as well as the great, was better off under the arrangements that were imposed.

Whenever men allow the management of their affairs to be assumed by an authority, or authorities, or when they undertake to follow literally a fixed code or tradition, no matter how it may have been acquired at the beginning, we speak of the arrangement as a form of *authoritarianism*. History shows that authoritarianism has always led to absolutism and totalitarianism. Some forms of authoritarianism, including some extreme versions, may be studied at first hand today.

With the possible exception of Rousseau, the philosophers identified with the theory that knowledge of the good is received have been especially prone to concentrate social controls in the hands of an elite few. It will be recalled that Plato assigned control to the guardian class because he believed they had knowledge not available to the ordinary individuals. Therefore, specially endowed individuals needed to be identified and put in command of the state so that their knowledge might be made to work for the good of all. This also was the role claimed for the emperors of Rome; for Catholic as well as for some Protestant bishops; for the feudal lords; for the absolute monarchs, especially those of England and France; and for the elite of many lands and in many times. Always their exercise of power was justified by the claim that greater benefits came to everyone as a result of the arrangement.

Authoritarianism based upon theories that knowledge of the good is discovered has generally rested upon more subtle lines of argument. In the several theories we reviewed in Part III, no claims were advanced for concentrating power in the hands of a hereditary class, and sometimes it was even suggested that at birth all men are basically equal. But, unfortunately, so the reasoning went, the good is not capable of being known directly, but can be found only by employing a process too intricate and involved for the undisciplined to employ. That is to say, the good is identified with an intangible universal intelligence or cosmic plan. As such, it is not capable of being observed directly but must be inferred from evidence gathered in experience. This is work for the experts, for the few men in each generation who achieve proficiency in the methods of philosophy or of science. In the face of the educated judgments of these experts, the ordinary, common-sense judgments of the average man must give way.

The role assigned the expert as the discoverer of higher knowledge has accounted for the various social arrangements which have concentrated power in the hands of an *intellectual aristocracy*. Societies which have submitted to the rule of an intellectual elite are also of course, authoritarian:

the ordinary individuals are required to submit to the authority of a few, usually those few who have had the advantages of a superior education and formal training.

The Flight from Authoritarian Abuses

A movement in opposition to authoritarianism in its several forms has been gathering momentum for many centuries. The freedom of inquiry enjoyed by the men of Athens during her most glorious years marked an early stage in the movement. The rise of Christianity brought unprecedented respect for all individuals and enhanced the dignity of the common man. The Age of Reason, the methods of science, the expansion of the geographical horizons of medieval Europe—each in its own way—brought more and more people to know a freedom of thought and of action formerly reserved to the few. The inevitable result was a growing resentment against the authority of the few and a discrediting of the theory that men must look for direction to either a hereditary or an intellectual elite. The dawning of a new day for the common man was announced in England with the establishment of the House of Commons, and in France with the rise to power of the Third Estate.

In enlightened states the world over, political power—the privilege of making the laws and of spelling out the policies governing community life—has now passed from the hands of the few into the hands of the many. The breakdown of authoritarianism has continued because wherever it has been given a fair trial popular government has been found to be followed by pronounced improvements in the well-being of the individual members of the society. *There is an implication in this movement that men are becoming disposed to judge knowledge by its consequences rather than by its origins.*

Conditions on the American frontier were especially favorable to the reaction against authoritarianism. The settlers were generally individuals who had objected to aspects of authoritarianism present in their home communities and had moved westward to find freedom from such restrictions. On the frontier, the great expanses of wilderness, prairie, desert, and mountains afforded them precisely the insulation against entrenched custom and power which they were seeking. In the isolated settlements they found it necessary either to fashion their own institutions and arrangements or to do without. Left to their own devices, these men and women, usually of very ordinary backgrounds as compared to the elite of their day and frequently without formal schooling, succeeded in fashioning a way of life that served their purposes more adequately than any previously imposed upon them by their so-called "superiors." On the American frontier, the common man be-

Fig. 64. In time unlimited powers of absolute monarchs were restricted as when King John of England was forced by his nobles to sign the Magna Carta.

came mature. He developed confidence in his own powers to make good decisions *guided by principles he put together himself,* and he came to prefer this method over any other for directing the course of his life.

The spirit of the frontiersman is still with us. It is apparent in the ideal of freedom held high in all quarters. The first amendments to our Constitu-

Fig. 65. Gathering of the Virginia planters in 1674. The cause of freedom was advanced greatly when the pioneers in Virginia and Connecticut first took up arms to defend themselves against the Indians instead of waiting for the king to send his troops to protect them as he was supposed to do.

tion, sometimes referred to as the "Bill of Rights," bear witness to the specific authoritarian abuses of individual liberty which the colonists had resented most bitterly. Among the rights asserted to be inviolable are the familiar freedoms of belief, of speech, of the press, and of assembly. Also clearly reserved to the individual are:

1. The right ". . . to petition the government for a redress of grievances"
2. The right of the people to keep and bear arms
3. The sanctity of the home

4. Freedom from unreasonable searches and seizures

5. In the case of arrest, ". . . the right to a speedy and public trial by an impartial jury of the state and district wherein the crime shall have been committed . . . to be confronted by the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense"

Fig. 66. The oppressed moved into the wilderness to find freedom and opportunity to build a better way of life.

Equally important, the necessary political and legal forms have been set up to guarantee these rights.

As the descendants of the frontiersmen gained wisdom and understanding, they extended the benefits of full citizenship to an ever larger number of the total population. Government by the people, either direct or through representatives directly responsible to the people, is now the accepted political form in the United States.

Each of the arrangements listed above and many more rest upon the philosophical assumption that knowledge of the good is available not merely to a few but to all. They bear witness to our faith that life is better under a government by the people than under any form of authoritarianism—at least any form of which we have knowledge at this time.

Authorities Suspected of Error

The reaction against authoritarianism brought about a significant change in the attitude with which the common man came to look upon knowledge itself. He has learned from bitter experience that he is likely to make mistakes, and, therefore, he does not claim—as authorities must claim—that his knowledge is final and complete. With becoming humility, he assumes that, given time, he may come to know more than he knows now. When that time comes, he expects to make better decisions than the ones he is able to make today. But he also knows that when he makes mistakes, and these mistakes are recognized, he is in a position to correct them. In contrast, when authorities make mistakes, they find it extremely dangerous to admit them. The mistakes of authoritarian governments, therefore, are exceedingly difficult to correct, a fact that became all too evident in the events that led to World War II and in the violence with which the disillusioned people ultimately disposed of their pretentious know-it-all leaders.

Thus, a significant aspect of the reaction against authoritarianism is found in the fact that ideas are now to the common man not revelations or discoveries in final form but merely ideas which he has put together himself. Like other products of his own creativeness, his ideas are subject to scrutiny, to criticism, to revision, and to rejection when better ones are produced. Yet the common man, aided only with knowledge which he looks upon as tentative and partial, has developed a way of life which he prefers to any other. He has found his way to yield greater satisfactions in the form of security, peace of mind, spiritual fulfillment, and material enrichment than the ways proposed by so-called "authorities" who have claimed access to some form of final knowledge. The suspicion has grown that the traditional authorities are not superior individuals who possess better knowledge and a better way of knowing but that they, too, have been merely ordinary mortals and that they may have been traveling under false colors. Wherever that suspicion has ripened into conviction, the foundations of authoritarianism have been deeply shaken. It should be noted again that the people have become suspicious of authoritarianism because *their own experiences have run contrary to the experiences which the authorities predicted they would have.*

Appeal to Scientific Knowledge

The reaction against authoritarianism noted above was fed to some degree by developments in the field of science. But until quite recently, the scientists who were dealing such telling blows against authoritarianism in church and

state, were deeply involved in erecting their own system of knowledge which they looked upon as absolute and final—namely, the body of scientific laws and principles. As we saw in Chapter 14, many of these laws were formulated by Sir Isaac Newton, who described the physical universe as a great machine. As such, its operation was said to be governed by fixed, unvarying, mechanical relationships which were described in precise mathematical formulas. His famous law of gravity is a case in point. By drawing a sharp distinction between *matter,* which he said consists of "solid, massy, hard, impenetrable, movable particles," and the external *forces,* such as "Gravitation, and that which causes Fermentation, or the Cohesion of Bodies," which he said push those inert particles about, he was able to identify and describe with unexpected precision a variety of machinelike cause-effect relationships. These are the *laws of mechanics* with which he and his followers were able to predict the outcome of various physical operations with great success. The accuracy of their predictions led many persons—philosophers and even theologians as well as scientists—to believe that those laws were descriptive statements of the natural order in its true and final state.

Scientific Determinism

With the acceptance of the theory of a machine universe, physical change and, consequently, the course of human experience came to be regarded as the products of the operation of the machine universe itself. Every event was said to have its natural cause, and, as a result, the intervention of God or even the free exercise of human will tended to be ruled out as controlling or directing causes. Whatever takes place in the universe was now said to be caused by forces which man cannot control and God will not alter. That is, the unfolding pattern of human and world affairs is *determined* for us, and the universal design or divine will which is bringing them about will be fulfilled whether we wish it or not.

The attitude that change in the physical universe is determined solely by the operations of the fixed and unvarying machine principles is known in science and philosophy as *determinism.* Its impact upon Western thought was particularly evident in the beliefs of the eighteenth-century deists. It also helped shape the principles of the laissez-faire economics taught by Adam Smith, as well as of the later evolutionists, who held that man is powerless to stop or even divert the forces of nature from achieving their predetermined ends.

The significance of scientific determinism for philosophy lies in the assumption that the machine principles can be discovered and that when they are known they can be used to predict what is to come. With such knowledge, man is said to be in a position to shape his actions to conform with the

universal plan. Indeed, man's well-being is said to depend upon such conformity, and it is this belief in the necessity to obey nature which has placed a high premium on scientific knowledge. The scientist, accordingly, has come to occupy the position of the one who knows—knows better than the average man can know—that to which we must conform. Since the cause-effect relationships are thought of as fixed and unvarying, his knowledge of them has also tended to be regarded as final knowledge. This has been especially true in the case of the laws and principles which have been used with great success in predicting physical change; and it is the history of successful prediction of physical change which has encouraged some social reformers to seek to discover equally reliable causal relationships by which they may predict and control social change. The tendency to regard the physical sciences as forms of final knowledge now calls for a second look.

Scientific determinism, as it appeared in the thinking of Newton and as it was applied in the physical sciences until recent times, was said to mean that "if we know the initial state of a system and the laws which govern it, we can predict its state at any other moment and verify our prediction by measurement." [1] The predictability of the future states was assumed because it was believed that the following three factors operate as constants in every transition:

1. The bodies (Newton's particles or groups of particles) present in a given system have a definite mass which remains constant. Thus, the forces acting upon these bodies can be varied at will, and the bodies will be made to move faster or slower, or the direction of their motion will be changed accordingly. The particles themselves may be disassociated and organized into new combinations, but the mass in the final state will be exactly equal to that of the initial state. This is the *law of the conservation of mass.*

2. The quantity of energy remains constant in a given system. True, its form may be changed, as in the transition from heat to light, but energy itself cannot be created or destroyed. This is the *law of the conservation of energy.*

3. The observer is strictly outside the system under observation, and neither he nor his methods of observation have any influence upon the system or the course of its transitions. Thus, the observer can know the states of matter exactly as they exist in nature.

By "knowledge of the initial state of the system" was meant, among other things, the location of each body in the system with reference to every other body in that system. For example, assuming the above constants and knowing the weight of the balls on a billiard table, their location with reference to each other and to the cushions, the force and direction of the thrust ad-

[1] Leopold Infeld, *The World in Modern Science,* New York, G. P. Putnam's Sons, 1934, p. 22

ministered by the cue, together with other necessary but knowable data, one may, it was believed, predict the location of the balls following a given shot, or even of a given series of shots. Furthermore, by using similar methods of calculation, the past history of a system may become known. That is, by taking into account the present location of the billiard balls on the table, together with our knowledge of the forces which are required to move them about, one may determine the exact position from which each ball started one, fifty, or even one hundred previous shots. By such calculations, scientists have constructed descriptions of the past stages in the history of the earth, and even of the stars in the sky.

The importance of the role played by mathematics in scientific knowledge and prediction is obvious from the above account. Their close relationship was demonstrated in the early days of modern science when, by means of careful calculations based on the laws of mechanics and on data gathered by observing known planets, the existence and location of several previously undiscovered planets and stars were inferred before they were actually seen by any astronomer. Later, when better instruments and techniques were developed, these bodies were found to be of the sizes and in the locations predicted.

Limitations of Scientific Knowledge

Recent scientific developments have not fully substantiated the mechanistic description of the universe or the view that scientific knowledge can be final knowledge. It has been shown that Newton went beyond his data when he inferred, on the basis of his studies in astronomy, that all matter, including the microscopic particles, behave in the ways he attributed to the celestial bodies. It has been shown that mass and energy do not always remain constant in the transitions from physical state to physical state and that the observer is very definitely within and therefore an active part of the system which he is attempting to describe in completely objective terms.

The reason Newton inferred otherwise was that the variations in the mass of the huge bodies of the celestial system are relatively so slight that they could not be detected with the instruments at his disposal. Nor could he observe molecules and atoms. Therefore, he assumed that these microscopic particles had the same nature and behaved just like the celestial bodies. Since then, new and improved equipment and techniques for studying matter have been developed. With their aid, observations of the behavior of microscopic particles have yielded data suggesting that mass may vary quite measurably as it is acted upon by force. It has been learned, for example, that when the velocity of a particle is increased its mass, instead of remaining constant, is also increased. Nor is the rate of increase constant, for the rate of gain in-

creases very rapidly as the velocity of the particle is made to approach the speed of light. Hence, a system which includes such accelerating particles will in its final state weigh more—that is, have a greater mass—than it weighed in the initial state; and, conversely, the amount of energy in the final state will also vary from that in the initial state.

With specific reference to the first two conditions given above on which scientific determinism was grounded, it is now believed that energy may appear as mass and mass as energy. The nature of the mass-energy equivalence was described by Einstein in the ominous equation $E = MC^2$. When it is recalled that C is the symbol for the speed of light (29,979,000,000 centimeters per second) and that when squared (multiplied by itself) it is a figure of astronomical size, we can begin to respect the diabolical power of destruction (represented by the symbol E) that is unleashed when as little as a single gram of fissionable material (M in the equation) is released as energy, as in the explosion of an atom bomb.

The substitution of a new principle, one which takes into account the equivalence of mass and energy, for the old principle, based on the supposed independence of mass and energy, would not of itself necessarily rule out deterministic thinking in the field of science. At most, such a substitution might merely make prediction more difficult. But further knowledge that has been acquired about the processes by which transformations in physical states take place does make prediction a dubious business. The celestial bodies, with which much of Newton's data dealt, are relatively so large that possible variations in energy acting upon them, such as heat and light and gravitational pull, bring about no perceptible changes in their mass. Their speed is quite slow when compared with the speed of energy particles, such as electrons or gamma particles. Newton did not know this, so he assumed that the basic particles which constitute matter are similar to the huge celestial bodies in every respect except size. But now it is thought that the basic "stuff" which makes up the matter of the universe is not massy and inert but rather consists of just such tiny but speedy bundles of energy. Matter thus has a dynamic quality, a potentiality for change and action which was completely lacking in the Newtonian view.

It is now thought that there are various kinds of particles of matter, some with a positive electrical charge, others with a negative charge, and still others which are electrically neutral like the neutron. Each particle is in constant motion and travels at a high rate of speed. They sometimes join in groups to form larger particles—or, more properly, constellations of particles, since they are not thought of as having either direct surface contact or fixed positions with relation to each other. The simplest of the constellations is the hydrogen atom. It is thought to consist of one positive particle, or *proton,* and one negative particle, or *electron.* The electron moves in an orbit about

the proton at a distance so great that if the atom were enlarged until the proton became the size of the head of a pin the diameter of the electron's orbit would be roughly equivalent to the height of a sixty-story skyscraper.[2] The atoms of the other elements of matter are merely more complex constellations of protons, electrons, neutrons, and possibly other kinds of energy

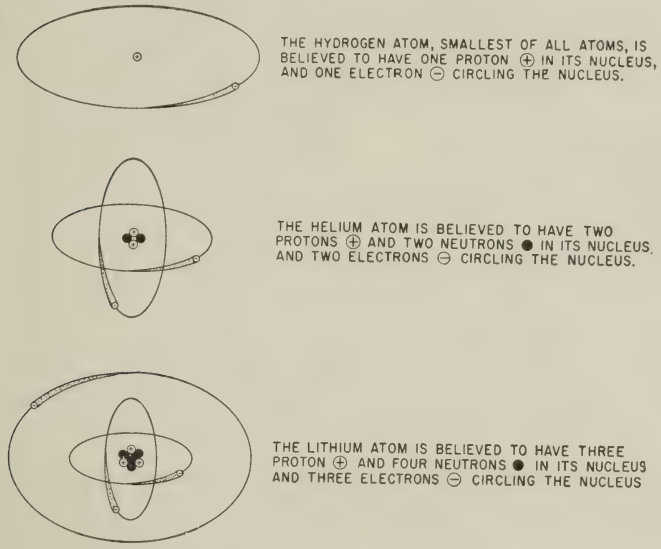
THE HYDROGEN ATOM, SMALLEST OF ALL ATOMS, IS BELIEVED TO HAVE ONE PROTON ⊕ IN ITS NUCLEUS, AND ONE ELECTRON ⊖ CIRCLING THE NUCLEUS.
THE HELIUM ATOM IS BELIEVED TO HAVE TWO PROTONS ⊕ AND TWO NEUTRONS ● IN ITS NUCLEUS, AND TWO ELECTRONS ⊖ CIRCLING THE NUCLEUS.
THE LITHIUM ATOM IS BELIEVED TO HAVE THREE PROTON ⊕ AND FOUR NEUTRONS ● IN ITS NUCLEUS AND THREE ELECTRONS ⊖ CIRCLING THE NUCLEUS

Fig. 67. Atoms are now thought of as constellations of particles in rapid motion. Some particles, such as protons, have a positive charge; others, such as electrons, have a negative charge; still others, such as neutrons, are neutral. (*Courtesy of the Westinghouse Electric Corporation.*)

particles, but always of such a number that the atom is electrically neutral. Thus, the second atom in size, the helium atom, has two protons, two neutrons, and two electrons.

Among these rapidly moving particles, each electrically charged and constantly in danger of colliding with other particles, electromagnetic forces exert their influences at all times. Old systems are broken up; new arrange-

[2] L. W. Chubb, *The World within the Atom,* Westinghouse Little Science Series Booklet, p. 12, Westinghouse Electric Corporation, 1946. An elementary and nonmathematical description of the atom and atomic research up to the time of the invention of the atom bomb, now, unfortunately, out of print.

While
NUCLEAR PHYSICISTS
are probing the core
of the atom . . .
. . . researchers in
SOLID STATE PHYSICS
deal with the electrons which orbit
around the core the way planets move
around the earth.
Scientists use . . .
. . . Electric or magnetic fields to change these orbits
. . . Light of high-energy wave lengths to break electrons out of their orbits . . . and so create new atoms
. . . Extreme heat, cold, or pressure to change electrons' behaviour
The results:
A host of new products . . . transistors, non-metallic magnets, solar batteries, new kinds of rectifiers
And more to come . . . Intermetallics with high melting points, tailor-made catalysts, new forms of carbon and graphite and of other materials . . . and new processes such as using radiation on chemicals.

Fig. 68. Atoms and molecules seem to act like complex constellations of energy particles. This diagram portrays the ways modern scientists are attempting to break up the constellations to transform one form of matter into another form or forms or to produce entirely new forms which have not existed heretofore. (*Courtesy of Business Week, a McGraw-Hill publication.*)

ments occur; collisions and explosions take place in which energy is released and small particles are hurled with tremendous speed in a process known as *radiation*. These are, in effect, newly created particles to which the old systems must now become adjusted. In brief, matter is not inert and static as Newton believed it to be but is very obviously dynamic and unfixed. New relationships are constantly appearing and new forces are brought into play, thereby creating conditions that did not exist previously. How, then, can there be accurate descriptions of initial states and predictions of future states? What are the fixed limits under which matter and energy can exist?

Probability and Scientific Prediction

The problem of prediction, as viewed by the nuclear physicist, may be illustrated in a crude way by trying to imagine what would happen to our calendars, clocks, weighing machines, economic systems, etc., if a body roughly half the size of our moon were to enter our solar system and become attached to the planet Jupiter. How would the gravitational field of the earth be affected? Would the earth's rotations be accelerated or slowed? How much would a quart of milk weigh? How many gallons of gasoline would be required to propel an automobile from New York to Chicago—assuming, of course, that there would still be a New York and a Chicago when the new equilibrium had been established? Physicists tell us that equivalent universe-shaking changes occur all the time among the minute particles which constitute the matter of the physical universe. How, then, can we calculate with any precision the future state of a given system of energy particles or discover its past history, as was held possible under the mechanistic theories?

The answer given by recent scientific investigation is that we cannot predict accurately for a *given* electron, proton, atom, or molecule. All that we can do is predict the behavior of enormous aggregates of particles. "We cannot apply deterministic methods of reasoning to the microphysical world because we can never determine the initial state of the system to a desired degree of accuracy." [3] As a consequence, we have had to resort to statistical methods of calculation and prediction. The nuclear physicist no longer attempts to predict the status or location of a given particle at a given time. He now hopes merely to develop formulas by means of which he can predict the *probabilities* of the occurrence of a specified event or a given relationship. Such formulas, however, are no more descriptions of matter *as it is in itself* than is a height-weight chart a device by which a detective can determine the weight of a particular bank robber if he has found evidence giving him a description of the robber's height. The relationships listed in the chart

[3] Infeld, *op. cit.*, p. 271.

merely indicate the *average* of the height-weight relationships which have been found to exist when a large number of individuals have been examined. Yet each one of the individual relationships may have differed, however slightly, from any of the averages. Nor is the chart, once it has been prepared, guaranteed to be an accurate prediction of future relationships, for should large numbers of individuals change their dietary habits the chart itself would soon become outmoded and new tables would have to be made.

In the same sense, scientific laws are now regarded not as final knowledge but merely as carefully prepared statements which summarize and interpret past experiences to help us anticipate what probably lies ahead. Such statements cannot be relied upon to forecast precisely the occurrence of specific events, even though, as a rule, they may help us prepare for the future, as is well illustrated in the use we make of scientifically prepared weather forecasts. The reliability of prediction in such areas as everyday mechanics is, of course, much greater, and for all practical purposes we use those predictions as if they were based on final knowledge.

Complete Objectivity Impossible

One further point should be made, with reference to the traditional assumption that the scientist has no effect upon the system he is studying, that he does not help produce the phenomena from which his descriptions of reality are inferred. This, it will be recalled, was the third assumption on which scientific determinism was said to depend.

Newton, whose data were derived primarily from observations of relatively large bodies, found it satisfactory to disregard the possibilities that his sensory data were anything other than exact descriptions of the objects under observation. Thus, for many years it was the boast of *objective* science that it was based on knowledge of reality uninfluenced by *subjective* factors. But modern scientists have abandoned the hope of achieving such complete objectivity. What, they may ask, is the real temperature of a glass of water? If we measure it with a thermometer, the resulting readings will be *averages* of the temperatures of the water, of the thermometer, and of the body heat transmitted to them by the person who took the readings. The readings, therefore, do not indicate the temperature of the water by itself.

In the microphysical realm the problem of securing objective and absolutely accurate data is even more difficult. For example, we now know that when we see an apple or a tree we do not sense the object directly. Rather, we merely interpret our experiences with the particles or rays of light which originate in the sun and are bounced off the object into our eyes. On the basis of such very indirect information, we then assume that the object

looks something like the sum of the sensory feelings we have in its presence. We assume also that the light particles which bombard the object do not affect its real nature and that we see it just as it is in its natural state.

The physical limitations of this naïve concept were first pointed out by Heisenberg in his principle of indeterminacy. He made it clear that even in physics it is impossible to observe or measure without some disturbance of the system under observation. In the laboratory, a scientist who wishes to see a microscopic bit of matter shoots energy particles at it and arranges to catch in a recording device either those particles which are bounced back at him by the object (as in radar) or those which miss the target completely. In the latter case, the particles shooting past the object outline a profile or shadow picture of it on the recording film or screen. In a very general sense, this is the principle of the X-ray camera and of the electronic microscope. Therefore, when such an instrument is focused upon a particle of matter, the process of seeing becomes roughly equivalent to that of making a picture of an apple by shooting grains of sand at it from a sand-blasting machine—the apple resting in front of a board covered with an adhesive substance that catches the pellets of sand which miss the apple as well as the relatively few which may pass through a part of it. How accurately would a picture developed in this manner portray the taste, color, smell, and feel of the apple? How valid, under such circumstances, would be a claim that the apple is just like our sandpaper picture of it and that it has no qualities or characteristics other than those indicated? How accurate would be the claim that the apple itself is not affected by the process used in making the picture? Would not our knowledge of the apple consist largely of inferences drawn from obviously limited data—limited because our equipment for gathering data was incapable of bringing to our consciousness descriptions of all the qualities needed to provide us with a complete picture? In fact, how do we know that the apple is really in itself nothing more than a crisp, fragrant, colorful, and juicy fruit? If we had another sense in addition to our normal five, might we discover qualities of which we are now completely ignorant?

Though they have direct bearing on the question of the objectivity of sensory experience, we shall omit for the present the data and the conclusions provided by the gestalt and other psychologists from their studies of perception. Some of these will be referred to in Chapter 20. It is enough for the moment to remind ourselves that later investigators have provided some interesting evidence challenging the view that our knowledge of our environment is either devoid of subjective inferences or a true picture of that environment in a strictly objective sense.

From considerations such as the above and many others, the revolutionary changes in science associated with the field theory, relativity, quantum mechanics, and atomic fission have come about. We cannot pursue them fur-

ther without straying too far afield for our present purposes. Enough has been said to indicate that in modern science laws are no longer regarded as descriptions of nature as nature really is. Rather, "The creative scientist is, in a sense, a creative artist. . . . The reports his theorems give of the universe is in part the work of his own mind and no mere replica of reality. Even more important, the modern scientist knows, or should know, that his theorems are not absolute truths, not truths in the tradition of religion and of most Western philosophy." [4]

[4] Crane Brinton, *Ideas and Men,* Englewood Cliffs, N.J., Prentice-Hall, Inc., 1950, p. 497.

CHAPTER 19

DEVELOPMENT OF THE THEORY THAT KNOWLEDGE IS CONSTRUCTED

It is generally agreed that Newton's scientific achievements caused great confusion and uncertainty in the philosophical world. His description of the universe as a mechanism in which quite natural causes account for equally natural effects ran directly counter to prevailing beliefs in a universe under the direct and immediate control of the supernatural. Pre-Newtonian philosophy expected miracles, looked for them, and frequently convinced itself it had found them in the unusual and unexpected events of everyday experience. Newton's science served to deprive such events of their supernatural qualities.

Immanuel Kant came to the rescue of traditional philosophy with what has been called a "piece of ingenious carpentry." He observed that Newton's solid, massy particles exist and are pushed about by the forces of nature only *within the limits of time and space*. In the time-space realm he held it perfectly proper for men like Newton to pursue their scientific inquiries. He agreed that the changes observed there are mechanistically determined and that man may therefore direct his adaptive behavior and plan his physical arrangements on the basis of principles derived by his scientific methods.

But Kant was not willing to admit that all of human experience is confined to the time-space realm. He held that scientific knowledge—knowledge discovered about the time-space universe—is limited merely to describing what *is*. It is useless, he contended, in pointing out to us what *ought to be*. Freedom and moral action would be impossible in a completely mechanistic world, because in such a world each act would be predetermined in the universal plan and man would have no personal responsibility for what occurs. Kant believed that the necessity "to act for the sake of what ought to be" is evidence that there is a reason beyond sense and that there is a method of knowing the good which does not begin with and depend upon

data provided by the senses. This is the realm of moral law, a realm of absolute ends, a realm above and beyond nature, a realm into which Newton's mechanical forces cannot reach and within which they do not operate.

Kant thus clearly divided the realm of human experience into two categories and subjected man to two separate but utterly superhuman influences. Man's natural activities and concerns were made to lie within the realm of time and space. They were to be directed by the light of knowledge discovered by scientific methods. His value judgments, on the other hand, were made subject to a supernatural factor, a moral will revealed or made known to him by an inner sense of duty. It is the moral will which points out to the individual what he ought to do, and thus, in Kant's opinion, moral actions and value judgments are determined for man no less than are his actions in relation to material things. Although what is expected of man in his two separate worlds of action is to be learned by two different methods, Kant held that the knowledge so acquired in either sphere has all the force of cosmic sanction behind it, and man is required to give unswerving obedience to what is demanded of him in either realm.

In three highly illuminating lectures, John Dewey showed how the division of the individual's loyalties and responsibilities between the world of science and material considerations, on the one hand, and the world of moral will and considerations of duty, on the other, contributed to the ease with which the German people forged ahead in science and technology but lagged behind in developing competency in self-government and self-determination.[1] As history has shown, the German people built well-ordered and efficient institutions but accepted irrational and inexpedient *ends* for which to use them. They made virtues of obedience, discipline, and efficiency but paid little attention to the fitness for leadership of those who commanded them in the name of duty.

To a large extent, the Kantian dualism—the concept of two realms not in conflict but dividing human loyalties between them—dominated Western philosophy in the nineteenth century. Hegelian and other forms of *idealism* came to represent the thinking of those who believed that the idea world should dominate and give direction to the natural order. On the other hand, naturalism, materialism, and other forms of *realistic* philosophy tended to build up the natural order at the expense of the world of supernatural ideas. Both groups of philosophies, however, were inclined to teach that the affairs of men falling in either category are shaped by forces beyond human control. Philosophy in all its various shades, therefore, maintained a decidedly authoritarian attitude.

[1] John Dewey, *German Philosophy and Politics,* New York, Henry Holt and Company, Inc., 1915.

Foundations of the New Philosophy

Though the common man fought against political, economic, and social authority for many centuries, as indicated in the preceding chapter, the reaction against authoritarian and deterministic thinking in philosophy is primarily a twentieth-century development. Of the earlier philosophical developments which led to the formation of a new philosophical system, the contributions of Charles Sanders Peirce are especially important. Peirce, who was identified with Harvard and Johns Hopkins Universities late in the nineteenth century, became aware of the frequency with which disputes over matters of belief, scientific theories, and philosophical ideas arise simply because the disputants do not attach the same meanings to the terms they employ. It occurred to him that if ideas were regarded as *plans of action* and defined in terms of the consequences that would follow if they were put to work the usual confusion and disagreements could, in the main, be avoided. Ideas, thus, would have *future* rather than *past* reference. They would indicate the actions to be taken and the consequences to be anticipated from those acts. Their meanings would become the same for everyone, and their validity could be established in experience. The only remaining basis for disagreement would be with reference to the ends for which the designated actions are to be used and the values by which they are to be judged.

Peirce's proposal for pinning down meanings found ready acceptance in the field of science. The modern scientific worker is now very likely to speak of the *operational principle* for defining scientific terms. He strives to make his meanings clear by describing or stating the specific operations his terms call for in specific situations, as well as to point out the consequences to be expected in each case.[2]

The practical value of the operational technique for defining terms soon caught the attention of workers in other fields. William James, for example, became convinced that it would be equally effective in fixing the meanings of philosophical terms. He wrote:[3]

> To attain perfect clearness in our thoughts of an object, then, we need only consider what conceivable effects of a practical kind the object may involve—what sensations we are to expect from it, and what reactions we must prepare. Our conception of these effects, whether immediate or remote, is then for us the whole of our conception of the object, so far as that conception has positive significance at all.

[2] See some of the writings of P. W. Bridgman on this subject, especially *The Nature of Physical Theory,* Princeton, N.J., Princeton University Press, 1936, chap. II.

[3] William James, *Pragmatism*. New York, Longmans, Green & Co., Inc., 1931. pp. 46–47.

James proposed that every idea should be regarded basically as a plan of action or as an attitude that describes the way in which we are to look at things, people, or other ideas. So regarded, two different ideas, if they are really different, will be expected to produce different effects when we act, think, or perceive as each idea indicates. Furthermore, we should assume that there is no difference between ideas unless it can be shown that when they are put to work in the realm of everyday experience some concrete differences are discerned in the consequences that follow. "There can *be* no difference anywhere that doesn't *make* a difference elsewhere—no difference in abstract truth that doesn't express itself in a difference in concrete fact and in conduct consequent upon that fact, imposed on somebody, somehow, somewhere, and somewhen." [4] Thus "six" and "a half-dozen" are merely different names for the same idea, for either name will get us identical results. But when we specify "a dozen" we get quite different results from those that follow when we ask for "a gross."

It also follows, in the opinion of James, that unless it can be shown how given terms stand for clearly distinguishable experiences it probably is a waste of time to treat them as representing valid ideas. For example, medieval schoolmen spent endless time disputing what was for them such verbal propositions as: Were persons born as babies in the Garden of Eden, or did they appear as full-grown adults? James would say that the debates in most cases were meaningless, for neither position brought about any practical difference in the quality of subsequent experiences. A modern James might say that much of the political discussion current today is also meaningless, for it is only when we take time to define such terms as *communism, socialism, fascism,* and *democracy* by describing the everyday behavior each calls for and the quality of individual experiences that follow from the adoption of such behavior that we can discuss the several concepts intelligently. Our failure to define them in operational terms has presumably been responsible for much of the confusion evident in political circles today.

Ideas and Their Consequences

The success with which James was able to apply the operational principle in defining philosophical terms led him to take a new view of the meaning of truth. Before this time, authoritarian influences in philosophy had represented ideas as pictures or descriptions of things said to have a real existence apart from our knowledge of them. That is, ideas were said to have *antecedent reality* or to be *antecedently real.* The Platonic definition of ideas is an example. Ideas, therefore, were thought to be valid or true in the same sense that we say a portrait is a true likeness of the sub-

[4] *Ibid.,* p. 50.

ject. That is, the truth of the portrait is judged by comparing it with the original, the source from which it is said to have been derived.

Philosophical ideas before Peirce and James were judged in like manner, and it followed that the source of an idea was traditionally regarded as the important consideration in estimating what significance we should attach to it. If it could be shown that the idea had been derived in the manner accepted as the proper way, or if it had been derived by a recognized authority or expert skilled in the use of that method, the truth of the idea was thought to have been established. It was in this sense that Plato's philosopher-kings, and the modern Marxian dialecticians, were justified and set up as fit rulers to command the loyalty and obedience of the common people.

James reasoned that this was an erroneous view of the matter. He held that when ideas are thought of not as copies or descriptions of a reality hidden from direct observation but as plans of action proposed as means for obtaining specified outcomes, truth will come to refer to the degree of reliability with which the predicted consequences follow when the indicated action is taken. For example, upon arriving in a given city, a tourist may consult a guidebook to help him select accommodations for the night. The book may list several establishments and describe in some detail the accommodations available at each. Thereupon, the tourist decides upon a particular establishment because, according to the book, it seems to offer those conditions which best measure up to his requirements. How *true* is the information provided by the book? Or, how *good* is the idea on which the tourist acts? Obviously, the final test resides not in the reputation of the agency that published the guidebook but in what the traveler finds when he has checked in or has inspected the premises.

So also, James would have said, is the truth of any idea or concept established. An idea is true when the consequences predicted are verified in experience. If the consequences are those which the idea leads us to expect, the idea in the form in which it is stated is said to be true. But if the consequences are other than those we are told to expect, the idea, at least as it is stated, is not true. This judging of ideas by putting them to work is sometimes referred to as the *pragmatic test*. James said that it implies an inclination of "looking away from first things, principles, 'categories,' supposed necessities, and of looking toward last things, fruits, consequences, facts."

Knowledge Is Tentative

From what has been said to this point, it should be clear that an idea is true not because it summarizes or reports connections or relationships that

have been observed in the past but only because it points in a reliable way to specified consequences to follow. Its truth is merely a probability and must wait for verification in action. Even when it is put to the test, we know only that it proved to be true (or false) in this particular instance and in such other instances where it is known to have been tried. What it might yield in other circumstances is still a matter for speculation. In this sense: [5]

Every proposition concerning truths is really in the last analysis hypothetical and provisional, although a large number of these propositions have been so frequently verified without failure that we are justified in using them as if they were absolutely true. But, logically, absolute truth is an ideal which cannot be realized, at least not until all the facts have been registered, or as James says "bagged," and until it is no longer possible to make other observations and other experiences.

The Constructive Role of Intelligence

But the facts are not all in. Time is still running on. Although the sun has appeared over the eastern horizon with great regularity for as long as man has any record thereof, and we confidently make our plans for the morrow fully expecting the light of day to break at a given hour, there may yet come a time when all our predictions on that score will fail. But there are other aspects of experience which are not so dependent as the sunrise and the sunset on the operations of the physical universe for they follow more directly from the acts of man. It is always possible that the activities we now engage in may alter subsequent events. By looking to the future, by selecting our present course of action, by wishing to bring about this particular chain of consequences rather than some other, we may influence the course of future events so as to bring about a different kind of world from the one we now have. In this sense, our reason, our ability to think of a number of ways in which we might act in a given situation, has what Dewey has called a *constructive* function. It is constructive because our selection of one plan of action (or idea) rather than another produces consequences "which could not be produced otherwise. Under these conditions the world will be different from what it would have been if thought had not intervened." And a world that can be made into something different from what it now is must be thought of as one "whose evolution is not yet finished, of a universe which is still, in James' term, 'in the making,' 'in the process of becoming,' of a universe up to a certain point still plastic." [6]

[5] John Dewey, *Philosophy and Civilization,* New York, Minton, Balch & Co., 1931, p. 24.

[6] *Ibid.,* p. 25.

When one thinks of the universe not as a finished creation in which all events have been fixed or determined for us beforehand but as one which is to a degree capable of being formed *by us* to suit our own ends, the creative, forming powers of reason take on a new meaning. To James, the devising of ideas that point to new arrangements and conditions and the testing of ideas so devised for their value in providing us with a more secure and rewarding future became the very meaning of mentality.

James gave little thought to the process by which such devising and testing activities might be made effective. The need for a "precise, logical theory of concepts, of judgments and inferences in their various forms" thus became the central concern of those who came after him. Hence, it is Dewey and the instrumentalists to whom we are indebted for a new way of thinking about the *process* of thinking. These later philosophers, most of whom belong to the twentieth century, have tried to show how thinking functions in making our future what we want it to be, in shaping the universe to suit our ends and purposes. In the new theory, reason is described as experimental logic in action, as the employment of intelligence in constructing knowledge of the good. It portrays reasoning literally as the process of creating and testing new ideas in the expectation that we shall find some which will point us to better ways of living than any of the ways we already have.

Creating New Ideas

As a result of his psychological studies, James was led to question the theories advanced by Spencer and other philosophers who had dealt with the psychological problem in the manner we have identified with the discovered tradition. The latter had said that concepts, theories, generalizations—in brief, all our ideas—are forced upon us, as it were, through our senses by an environment which is constructed like a machine and whose operations are governed by mechanical principles. The environment was thought to impress itself upon human consciousness bit by bit. As the quantity of sense data accumulated, concepts were said to emerge which provided the bases for organizing the data themselves into logical systems, and thus their meaning was said to become known to us. It will be recalled that with this theory was associated the belief that concepts so formed are descriptions of reality itself, that they are discoveries of the secrets of nature by means of which we come to know what nature is like as well as what she expects of us.

In contrast, James became convinced that "many of our most important modes of perception and conception of the world of sensible objects are not cumulative products of particular experiences, but rather original biological

sports, spontaneous variations. . . ." That is to say, new ideas, new relationships, new ways of looking at things may suddenly occur to us. The human mind is apparently of a dynamic nature which renders it capable of projecting novel relationships and interpretations even when it is facing familiar situations. Such mental mutations, however, must not be regarded as something that happens to us, such as when we receive a gift or find a coin, but as something that we ourselves help to bring about. We are involved as active participants in the creative process, and the new idea invariably has some relationship to aspects of our individual personalities and previous experiences.

The importance of past experiences in the creation of new ideas is especially evident when ways of thinking and acting found satisfactory in other situations are adapted to fit the present need. The adaptation and modification of solutions borrowed from other situations is sometimes referred to as the *reorganization of experience*. The ability to reorganize experience, and, more specifically, the achievement of such a reorganization on the intellectual level to bring about more effective ways of living, has come to be called *insight,* and the development of insight has understandably acquired great educational importance in recent years.

In studying the phenomena of insight, psychologists have become convinced that individual differences, by which we mean not only what James called "cerebral instability" but also the variety of experiential backgrounds, play a significant role in causing previously unknown or unthought-of suggestions or ideas to appear. This fact has been recognized only recently in philosophical circles, and it is one of the major reasons why those in sympathy with the views advanced by James and Dewey have made respect for individual personality a moral principle. The American frontiersman learned this lesson in everyday experience and incorporated it in his federal and state constitutions in the form of guarantees of the basic freedoms, which eloquently proclaimed his belief that contributions of great social value may come from the nonconformists as well as from the conformists among us.

Constructing Knowledge of the Good

We said above that an idea is true if the predicted consequences come about when we act as that idea indicates. The idea is good, however, only when the consequences contribute to our general well-being. It may be true, for example, that a lighted match will burn my fingers if I should be rash enough to grasp it by the flaming end. But certainly, in ordinary circumstances, it is not a "good idea" to grasp burning matches. In the earlier discussion, our emphasis was upon determining the truth of ideas.

It is our present purpose to show how the goodness of ideas, their acceptability as guides to better ways of living and therefore as additions to our fund of knowledge of the good, may be determined in a similar manner.

Psychologists tell us that new ideas do not generally appear haphazardly and without reference to environmental conditions. Rather, they are the result of feelings of inadequacy or maladjustment which are brought to our attention through experience. Perhaps some arrangements or environmental conditions depress our status or restrict our efforts to achieve fulfillment. In brief, we are made aware of a perplexing, disturbing, uncomfortable, or confusing situation, and the resulting urge to do something about it sets off the creative process.

Awareness of a need for action is frequently accompanied by an immediate recognition of the proper way to deal with the situation. Thus, even the infant will grasp for support when he feels himself falling. The need to act leads directly to the action in such situations, and no knowledge beyond that already in our possession is required to cope with the problem. *Such a situation does not require the construction process, and no new knowledge is necessarily produced.*

Many situations are encountered, however, in which no immediate solution is available, or in which the first impulse to act is arrested because the action indicated is suspected at the outset as one that will lead to consequences not entirely satisfactory. In other words, the first suggestion, the idea or plan of action which first comes to mind, is held in abeyance while we look around for some other more promising way out of the difficulty. It is during this waiting period, this time of reflection, that the "cerebral instability" referred to by James may result in our seeing new relationships among the factors under consideration. That is, a new idea may occur to us quite suddenly in what we call a flash of insight. Once it has appeared we may examine it just as we submit any other idea to scrutiny. During the examination, we try to anticipate what would be the probable consequences if we were to act upon it. If the projected consequences are not to our liking, we search for other ways of dealing with the situation that promise more acceptable results. The purpose of the waiting period is to make certain that we need not act on impulse but may deliberately select from a number of alternatives that idea which represents the best plan of action we can devise under the existing circumstances.

It is important to note that in James's philosophy the source of an idea —who suggests it or in what manner it is brought about—has little importance. Ideas are created in the normal functioning of the mental processes. Some ideas are good ones, but also many are worthless. Once an idea has been produced, it may be examined and tried for what it is worth. If it is found to serve a useful or satisfying purpose, it is judged to be good

for that purpose and in those circumstances, and it is added to our growing fund of knowledge of the good. Such an idea must be thought of as having been produced by us out of our own experiences and by processes which are part of our own natures. James held that even our concepts of "numbers, space, time, resemblance and other important 'categories' could have been brought into existence . . . as a consequence of some particular cerebral instability, but they could by no means have been registered on the mind by outside influence." Such concepts have been built up and given respectful attention because over a long period of time and in a variety of situations they have been found to be useful and satisfying ways of thinking about and dealing with "concrete instances and things of experience. It is, therefore, not the origin of a concept, it is its application which becomes the criterion of value . . . ," the test of the good. And here, said Dewey, we have the whole of pragmatism in embryo.[7]

Intellectualizing the Problem

It was suggested above that the construction process begins with a feeling of uneasiness, of inadequacy, or of something lacking in the present state of affairs. It may not be clear to us precisely what is amiss. In such a confused situation, a variety of suggestions may be heard not all of which have reference to the same point. For example, when visiting in a given community one may sense a spirit of unrest. There may be muttered protests about "the way things are run in this town." An effort to track down the cause of the discontent may elicit comments from individual citizens, such as: "The Chamber of Commerce runs everything"; "The Board of Education is a one-man show"; "There's nothing provided for our young people"; "The teachers are incompetent and lazy"; "Everybody is money-mad"; "They're teaching nothing in school but socialism these days"; "My child isn't getting the fundamentals in school"; "Why can't we have a good athletic program like other schools do?" Obviously such a variety of complaints indicates that the basic difficulty has not been clearly identified and that what is needed is a more accurate definition of the problem.

What are the causes or the conditions of the state of unrest? What are the goals the individuals wish to achieve? In what ways do the existing circumstances fall short of those to which they aspire? Setting limits to the problem and defining the goals to be achieved involve "a process of *intellectualizing* what at first is merely an *emotional* quality of the whole situation. This conversion is effected by noting more definitely the conditions that constitute the trouble and cause the stoppage of action." [8]

[7] *Ibid.*, p. 29.

[8] John Dewey, *How We Think*, 1933 ed., Boston, D. C. Heath and Company, p. 109.

With a clearer understanding of the real problem at hand, having identified more precisely what is wanted and what factors block the way to its attainment, one may then examine the several ideas suggested in the earlier stage more effectively. Obviously some suggestions may now be judged to be irrelevant and may be eliminated from further consideration without delay. Others may be seen to have a direct bearing on the problem and to merit further study. It is also probable that as one focuses more intently upon the problem and as its aspects are noted more minutely and accurately, still more ideas for resolving the difficulty may occur to him. This is exactly what is hoped for, and several distinctive approaches to the intellectualization of problems (the process of defining the problem and of producing and examining ideas for solving it) have been developed.

The Historical Method

Reference has been made to the possibility that new ideas may arise as a result of what was called the reorganization of experience. In that process, previously tried solutions are transplanted from past situations, and, after necessary modifications, they are made to fit the present conditions. Obviously, however, those seeking a solution must have a suitable background of experience upon which to draw. In a general sense, no one has a completely adequate background of experience, not even for a given problem, for if his experience were fully adequate there would be no problem. What is needed, therefore, is information about similar problems which others have encountered and their experiences in dealing with them. In what aspects were their situations different from our own? What forms of action did they try, and what were the consequences? What aspects of their solutions might be useful to us, and which are unsatisfactory? In brief, the intellectual process of constructing knowledge may be fostered by searching the records of other people living in other places and in different periods of time, as well as by reviewing our own personal experiences. And since the cumulating heritage of social experiences is more extensive and varied than our own, it may be even more productive of ideas.

To utilize effectively the experiences of others in dealing with our own problems, we need to learn how to draw upon our social heritage. This involves not merely a knowledge of the elementary techniques of historical research but also some familiarity with the general scope and content of the record of man. By reviewing the experiences of others who may have lived or may now be living in faraway places, or at other periods in history, those experiences can be added to our own direct experiences and can thus be included in the reorganization process. Such a study of present problems in the light of the experiences of others is likely to result not only in

the suggestion of new ideas but also in a much deeper understanding and more constructive appraisal, comprehension, and analysis of the problem itself.

It is also apparent that the historical method cannot be used successfully unless there is freedom to inquire, to search widely, to consider all points of view, and to examine critically. It involves freedom to suggest and to discuss openly, and full access to the records of the past. It also implies that before a commitment to act upon a given suggestion is made, we would do well to examine the problem and the suggested solutions from the standpoint of their historical backgrounds. While we cannot judge new ideas with complete certainty before trying them, the historical method will contribute to the formation of enlightened judgments. Even so, our decisions to act will of necessity always be somewhat in the nature of calculated risks.

The Experimental Method

In instances where the historical method does not provide sufficient knowledge to justify our taking a calculated risk, or where the idea under examination is so new that we have little if any evidence about its probable consequences, we may have to resort to experimentation. Experimentation of this nature is not to be confused with irresponsible meddling. Rather, it is a deliberate attempt, carried on under controlled conditions, to secure evidence by which the ideas in question may be appraised. As such, it must be conducted with due regard for the dangers that are inherent in every situation in which we in any way deal with or take into account the unknown.

The use of the experimental method in dealing with scientific and technological problems is familiar to all of us. We are acquainted with the types of controls that are set up to assure that the right consequences are related to the particular procedure under examination. We know also of the safeguards that are employed to protect against harm, should the results be other than those we have anticipated. From such experimentation, we learn what to expect and thereby become better able to judge ideas in the light of their probable consequences.

The experimental method is not so easily applied in dealing with social problems, for the individuals involved in whatever experimentation may be planned are not likely to accept the necessary controls or to submit to the possible risks. It is for this reason, if for no other, that the historical method is employed more widely than the experimental method in the social sciences.

The Logical Method

Problems and suggested solutions may also be examined logically with a view to defining them more precisely and to producing more promising ideas for dealing with them. The logical method, essentially a mental process, consists of a systematic analysis of the statements in which the problem and its suggested solutions are couched. The skillful logician has been trained to follow established rules of procedure and to stay within the bounds of valid inference. These rules and general procedures have been developed out of many years of experience. Thus, when an idea is submitted to logical analysis, some of its hidden potentialities as well as its undesirable implications may be brought to light.

Excellent examples of how the logical treatment of problems or ideas develops and refines them may be found in the use made of mathematics in the technical and scientific fields. When a new idea is proposed in these areas, mathematical treatment of it gets under way almost immediately. Precise calculations are made on the basis of purely hypothetical applications of the idea. The resulting *purely theoretical* data are then used to test the original assumptions and to make alterations in them. It was by means of such calculations that Newton laid the basis for the law of gravity and the nuclear physicists were prepared to observe the first atomic explosion from a safe distance.

Testing Ideas

The type of information produced by historical research, experimentation, or the application of logical processes should not be confused with final knowledge. Nor should an idea developed by one of these methods be regarded as the equivalent of one that has already been tested in experience. Even logic, including the mathematical techniques employed by research scientists, though vastly useful in bringing forth considerations not available in other ways, nevertheless merely brings forth *ideas*. As such, they are still untested suggestions or theories, no matter how much they may have been refined. Their value, their worth as guides to better arrangements and conditions of life, cannot be established short of an actual test in experience. The necessary and final step in constructing knowledge of the good, therefore, must be the practical one.

In a practical situation which calls for a solution, the intellectualizing process should result in the gradual elimination of all but one of the possible courses of action. That one will be the one which seems to offer the greatest promise under the existing circumstances. That idea will be analyzed and re-

fined in light of all the evidence that can be secured. When, in light of all the evidence, we are led to believe that we cannot do better, we proceed to put the idea to the test.

Each test of a new idea and each application of a familiar idea in a new situation is likely to yield some surprises. Unexpected results are forever being encountered. A plan, carefully laid, may result in all that we anticipated from it; but it may also lead to only partial success, or it may even end in failure. It is not merely failure, however, for the relationship observed between what was done and what followed constitutes new information which can be used in making a new effort. The experience of failure, or even of partial success, is likely to provide the basis for restating the problem in new terms and for preparing a new plan of attack. The original idea is revised in light of what has been learned, and a new test may be warranted.

It is thus that the experience of failure as well as of success is productive both of new ways of appraising ourselves and our environment and of new ideas for enriching our future experiences. New ideas occur to us from time to time as we proceed daily about the business of living. Once they have appeared, they may be examined and tried for what they are worth. If found good, they are retained and are added to our general fund of knowledge. If not, they are discarded. It is in this way that our fund of useful ideas is said to be enlarged and knowledge of value in building the good life is constructed. The ability to construct progressively more effective knowledge for enhancing our experience is coming to be identified with what we mean by *intelligence*.

Practical Advantages of Constructing Knowledge

The story of modern scientific and technological advances is a familiar one. However, few of us realize that these developments came as a result of the way scientists and technologists have learned to think about our physical environment and the kind of life we ought to live. They have come to regard difficulties, hardships, and even minor inconveniences as temporary obstacles which can be overcome. They have come to expect to surmount them, and, therefore, they have set about the job of doing something constructive about them. It is the attitude of expecting to make progress that has made possible the advances we recognize all about us.

Witness, for example, the changes that have occurred in the field of transportation. Primitive man was dependent upon the strength of his own body to provide him transportation. Think of the inventive genius required for him to "see" a fallen sapling not merely as a potential club but also as a lever and later as a yoke by which the strength of two men could be combined. No less revolutionary was the emergence of the idea of the roller made

from a section of a larger log. Then followed the invention of the wheel, which was merely a segment of the roller, and ultimately the joining of two wheels with an axle, much as two men are joined together when carrying a pole between them. The wheel and axle made possible the development of the cart. The experiences derived from pulling the cart ultimately stimulated someone to see the possibilities of harnessing animals.

The changes described above did not occur rapidly. One of the reasons for the slow pace in the development of new ideas undoubtedly was the lack of a written language, hence the lack of a historical method by which the experiences of one generation might readily be made available to the next. Another, perhaps even more important reason was the inability of primitive man to expect to make progress and therefore to seek deliberately to develop new ideas by means of which progress might be brought about. This is no longer the case, and, as a consequence, many of us have witnessed more innovations and improvements in our modes of transportation during our own lifetime than occurred during all the history of transportation up to the present century. There is a greater technological difference between the modern jet-powered transport plane and the first horseless carriage than there was between that same horseless carriage and Caesar's chariot.

In spite of such phenomenal developments, science and industry are expending greater efforts today to induce new ideas to emerge than at any other time in history. The modern automobile may be the best we know how to build at this time. However, we are systematically gathering information based upon our experiences with that automobile under present conditions in the confident expectation that this information will help us see new relationships and invent previously untried adaptations which we are certain will result in our being able to build even a better model in years to come.

Just as we gradually build up ideas through the reorganization and redirection of experience in technological areas, so also do we acquire better control over our personal and social affairs. Witness, for example, the progress that has been made in dealing with the age-old problem of the relationship between the man who labors for a living and the man who uses the labor of others. History tells us that in primitive societies the laborer was a slave under the complete domination of his master. That relationship had changed but slightly by the time of the feudal period, when the serf was bound to the estate on which he was born, usually for life. The development of the guilds marked the introduction of a new type of relationship. From it has emerged our modern system of collective bargaining. As the interests of the public have become involved in these negotiations, laws have been enacted to regulate them. The Wagner labor legislation, a case in point, embodied the best thinking Congress was able to agree upon at the time of its

enactment. When subsequent experiences suggested the need for revision, a new law was written. Experiences with the new law indicate that the construction process has not as yet produced a completely satisfactory solution in the area of labor-management relations and that the search for better ideas must continue. Our confidence in the productiveness of the construction process induces us to believe that better ideas will ultimately be produced.

So it is in every area of life, say those who teach that we must construct our knowledge of the good by the method of intelligence. We must learn to look for ideas everywhere and to expect them to appear anywhere. It is not the source of an idea that determines its worth but its effect in the realm of human experience. We come to know the good because it is good for us. In this simple, practical test is hidden a new and profoundly potent philosophical attitude.

CHAPTER 20

PSYCHOLOGY AND THE THEORY THAT KNOWLEDGE IS CONSTRUCTED

The new developments in philosophical and scientific theory reviewed in the two preceding chapters were accompanied by corresponding changes in other areas, among them psychology and education. Psychological theory in particular has always followed closely the leads established by philosophy, and it was not long before William James, John Dewey, and others attentive to the practical implications of the new philosophical outlook were busy reexamining the psychological teachings of their day. It should be noted that James entered upon his studies somewhat earlier than did Dewey. For this reason, there are marked differences in the problems which caught their attention and in the aspects of psychological theory which they developed. The line of thinking initiated by Dewey is of particular interest to us at this time.

The Reflex-arc Concept Reexamined

When Dewey became active in the field of psychological inquiry, the field was already rapidly coming under the domination of the physiological psychologists. The most powerful weapon in their arsenal was the concept of the reflex arc. Certain aspects of the impact made upon psychological theory and educational practice by the introduction of this concept were described in Chapter 17. We observed that psychologists were now able to abandon the methods of speculative philosophy and to replace them with the methods of objective science. Consciousness and other aspects of mental behavior were now described as purely physical functions. Overt behavior was made the primary object of study, and its causes as well as the mechanisms of its control were sought. Now it was said that specific ways of responding are connected with equally specific forms of stimulation, and that the connections

are provided by specific though modifiable physical structures in the central nervous system.

Almost inevitably, a tendency appeared to regard stimulus-response connections in mechanistic terms, a tendency that was encouraged by the inclination to reason about them from the analogy of the closed electric circuit. Thereafter, psychological research was undertaken to discover exactly which mode of response is connected with which form of stimulation and how new but equally effective connections are established. In light of such developments, it is easy to understand why psychology which employed the reflex-arc concept to explain the stimulus-response relationships became known as a form of *association psychology*.

In this instance we are especially interested in the manner in which the psychologists said new ideas originate. Thinking, it will be recalled, was described as a form of verbal trial and error in which words, images, and other symbols function as stimuli and substitute for overt acts as responses. Thinking came to be looked upon as the process by which we establish new verbal stimulus-response connections or mental habits. An idea, therefore, was said to be a mental habit. It is acquired by trial and error, and once it is established it was said to be as specific, repetitive, and mechanical as any other habit and to function without failure until the conditions under which it was established change.

It is readily seen from the above that to the physiological psychologist the selection and fixing of a specific idea appeared to be the acceptance by the learner of a mode of *adaptation to* the environment as he finds it. Clearly it is not a plan of action by which he seeks to redirect the course of evolution or to make over the environment into what it ought to be. It follows from this view that, for the physiological psychologist, ideas are determined for us just as mechanically as are the trajectories of bodies moving through space; and we are, for that reason, the slaves of our environments rather than the masters.

This view is in sharp contrast to James's belief that an idea, especially a new idea, is akin to a biological sport, a sudden and to a degree unaccountable reconstruction of things as we find them to make them into what we believe they ought to be. That is to say, James believed that ideas are inventions or creations and not merely observations or discoveries. They are, for that reason, the instruments that enable men to escape the chains of physical cause and effect which otherwise would be fastened upon them by the blind forces of nature. This conflict is central in the distinction separating the theory that knowledge of the good is constructed from the two theories reviewed earlier. It is hoped that the importance of this distinction may become clearer with further study.

It is clear that the descriptions of mental behavior in general and of

learning in particular given by the physiological psychologists rest upon the validity of the reflex-arc theory. If the reflex-arc concept is shown to be invalid, a new psychological theory is called for. This fact was recognized almost as soon as the physiological line of psychological thinking was announced, and the reflex-arc concept came under careful scrutiny without delay.

Criticism from Theorists

As early as 1896, John Dewey objected to the description of human behavior in the mechanistic light implied by the reflex-arc theory. The difficulty, he said, arises from the tendency to think of the stimulus, the neural connection, and the response as separate and distinct entities, each independent of the other two.[1] Accordingly, an act is thought of as beginning with a sensation and ending with the response. The time sequence that is assumed to exist between the two therefore makes it appear that the sensation *causes* the response. "As a result, the reflex-arc is not a comprehensive, or organic, unit but a patchwork of disjointed parts, a mechanical conjunction of unallied processes." This Dewey believed to be a misrepresentation of the matter, and he called for the reinterpretation of what is called a reflex arc as a single, unified *coordination*.

In developing the coordination concept, Dewey wrote:[2]

> We begin not with a sensory stimulus, but with a sensori-motor coördination, the optical-ocular, and that in a certain sense it is the movement which is primary, and the sensation which is secondary, the movement of body, head and eye muscles determining the quality of what is experienced. In other words, the real beginning is with the act of seeing; it is looking, and not a sensation of light. The sensory quale gives the value of the act, just as the movement furnishes its mechanism and control, but both sensation and movement lie inside, not outside the act.

Dewey went on to say that the stimulus in a typical stimulus-response situation is not merely the irritation of a receptor by an outside agent, such as light from a candle or air waves set up by a vibrating string, but is, in fact, a complete act. The act consists of catching the excitation and *fixing its meaning for the organism* that has caught it. Before it can become a sensation, it must be interpreted; that is, the subject must come to regard it as calling for or meaning a particular kind of adjustment to it. It is the act of interpretation which is the actual seeing or hearing, and it is the

[1] John Dewey, "The Reflex-arc Concept in Psychology," *The Psychological Review*, vol. 3, no. 4 (July, 1896), pp. 357–370.

[2] *Ibid.*, pp. 358–359.

seeing and *hearing* themselves with which the psychologist should be concerned. Psychological research, therefore, stood accused of having employed an erroneous concept of what initiates and helps shape the behavior of its experimental subjects.

Dewey continued his analysis by showing that an act of seeing may stimulate another act, such as reaching. If such a sequence occurs, it is because the seeing-reaching now constitutes a larger, more inclusive coordination in which seeing defines and directs the act of reaching. The reaching, in turn, controls and stimulates the seeing. "The eye must be kept upon [the object] if the arm is to do its work; let it wander and the arm takes up another task. In other words, we now have an enlarged and transformed coördination; the act is seeing no less than before, but it is now seeing for reaching purposes." [3] In such a coordination *the individual* or organism undergoing the experience *contributes to the nature and quality of the act just as effectively as does the environment.* This view has serious implications for the claim that psychological data can be purely objective. It suggests that such data may have a substantial measure of subjective quality, a view now shared by the physical scientists, as indicated in Chapter 18.

A similar criticism of the reflex-arc concept was brought forward in 1923 by Thurston.[4] He, too, rejected the notion that behavior is described adequately by identifying the stimulus and the response and then assuming that there is a neural connection between them. In place of this view, he proposed that we regard behavior as beginning with the individual. Who is he? What is he? What is he trying to do? What kind of satisfaction is he trying to attain? What are his characteristic modes of expression? What drives are motivating him at the moment? When we ask such questions, he wrote, it is better to think of stimuli as merely the environmental facts in terms of which the individual expresses himself. In this arrangement, he went on to say, behavior must be considered as starting not with a feeling or sensation but with the individual. Rather than originating action, the stimuli merely give direction to action while the individual is in the process of acting. That is, they help in selecting, but do not control, the particular form the behavior will assume under the particular set of circumstances in which the individual is located. Thus, Thurston continued: [5]

> The datum for psychology is the dynamic living self and the energy groups into which it may be divided. We may refer to this datum as the will to live, or we may call it the life impulse, or the vitality of the organism, or we may discover it to be the energy released by metabolism. We may be able to subdivide our

[3] *Ibid.*, p. 359.

[4] L. L. Thurston, "The Stimulus-Response Fallacy in Psychology," *Psychological Review*, vol. 30 (1923), pp. 354–369.

[5] *Ibid.*, p. 356.

will to live into large energy groups which manifest themselves in conduct more or less independently. These energy groups would be our innate, dynamic, and more or less distinct sources of conduct, and we might come to call them drives, motives, instincts, determining tendencies, or any other words that represent that which we as individuals innately really are, that which characterizes us as persons with individually preferred forms of life.

A few sentences later he stated very emphatically: "The stimulus is not primarily provocative of living, mental life. We, ourselves, are."

At approximately the same time, Kurt Koffka, one of the founders of the gestalt school of psychology, also joined his voice with those who were expressing their dissatisfaction with the reflex-arc concept. He was particularly critical of the arbitrary way in which feelings, purposes, and other so-called "subjective" factors which the subject, especially the human subject, may experience while his behavior is under observation, are dismissed by the research psychologists as data of no scientific significance.[6] Koffka reasoned that the mere fact that man is capable of making descriptive reports of his experiences and of utilizing such experiences in redirecting his behavior is a scientific fact of the utmost importance. He held that we are justified in denying the existence of elements of conscious experience only in those instances in which the method of experiential observation is inapplicable. Since, however, the science of psychology seeks to describe and therefore to give control over human behavior, and inasmuch as consciousness is an operating factor in at least some behavior, it is not possible to exclude this aspect of behavior from consideration.

The gist of all these criticisms, echoed by a growing number of able scholars, seems to be that the stimulus cannot be correctly identified and defined without taking into account what "lies within the skin" of the subject, as one critic described it. The stimulus is not merely what the experimenter can observe and measure but must also include everything that motivates the subject from within. The subject acts or refuses to act in accordance with what appears appropriate to him, and this is not necessarily the same as what the experimenter has determined in advance shall be the motivating factor or factors. The subject sees, hears, touches, or otherwise takes note of his environment in light of what these several aspects mean to him. His interpretations of these aspects cannot possibly be the stimuli which the experimenter has set up for the simple reason that the subject expects a different set, his own personal set, of events to follow from his contacts with them. As a consequence, he projects his relations with them in a different light from that of the experimenter, and he proposes to make different uses of them. The difficulty encountered when we attempt to

[6] Kurt Koffka, *The Growth of the Mind,* New York, Harcourt, Brace and Company, Inc., 1931, pp. 16–22.

identify what it is to which the subject is responding has led to some misgivings of a logical nature about the adequacy of any theory which attempts to describe behavior, especially that of human beings, in strictly mechanical terms.

Criticism from Experimental Psychologists

Doubts about the ability of the psychological investigator to identify accurately and objectively the real stimuli to which the subject responds have been supported by research on perception conducted by members of the gestalt school.[7] As a result of their experiments, especially those involving the way we see things, gestalt psychologists have concluded that a stimulus cannot be said to be an objective entity. That is, a stimulating factor has no fixed characteristics that make it appear the same to everyone at all times. Rather, it is the product of what the observer does with, and possibly to, the environment in which the stimulus is encountered. What the subject does is to organize the various elements he identifies within that environmental situation in such a way that the situation as a whole has meaning for him. Hence, how he behaves in that situation is related to *the way he organizes it* and not merely to the undisturbed, external environment itself. Thus, it is the organization of the environment (the *gestalt*) by the subject which should be our primary concern when we seek to learn why he behaves as he does; and it is unscientific, said the gestalt psychologists, to connect the behavior of the subject which the experimenter observes with whatever stimulus he has arbitrarily defined in advance. On this point, the gestalt position is essentially the same as that reached by Dewey and Thurston by logical processes.

The line of scientific inquiry into the nature of perception initiated by the founders of the gestalt school has been continued and extended by Ames, Cantril, and others.[8] The evidence that has come from these later studies tends to support the earlier conclusions and has led to the definition of perception as *transaction* or, more precisely, as "that part of the process of living by which each one of us, from his own particular point of view, creates for himself the world within which he has his life's experiences and through which he strives to gain satisfactions."[9] Central in this definition is the

[7] Some of the more important of these studies have been reported by Willis D. Ellis in *A Source Book of Gestalt Psychology,* New York, Harcourt, Brace and Company, Inc., 1938.

[8] See especially William H. Ittelson, *The Ames Demonstrations in Perception,* Princeton, N.J., Princeton University Press, 1952; and W. H. Ittelson and F. P. Kilpatrick, "Experiments in Perception," *Scientific American,* vol. 185 (August, 1951), pp. 50–55.

[9] William H. Ittelson and Hadley Cantril, *Perception: A Transactional Approach,* New York, Doubleday & Company, Inc., 1954, p. 5.

assumption that "perceiving never takes place 'by itself.' It can only be studied as part of the situation in which it operates." [10] Even the scientist studying perception cannot retain an objective position outside the transaction but is himself an active participant, and his data must therefore always be to a degree subjective.[11] To some, the transaction theory appears to have implications which may in time bring forth a distinctly new line of psychological thinking. We must take note of it even if it does seem too early to treat it as a separate school at this time.

Returning to the gestaltists, we find that they detected still another difficulty in assuming a causal relationship between stimulus and response. They found that the organization or stimulus which the subject may recognize at the beginning of an experiment does not necessarily continue to influence or direct his behavior in later stages. Thus, the rat in a maze may be acting under one stimulus at the beginning of his run and under another at the end nearest the food. This shift is also apparent in the case of the middle-aged professor who, in a burst of enthusiasm, sets out to walk to his office two miles away. The initial impulse may change rather quickly and may indeed lead to regret. If he does complete his journey on foot, it may well be that the actual stimulation during the latter part of his walk is not the desire for physical exercise but a fear of loss of face before his family and friends. Thus, again, it is extremely doubtful that in a given experiment the stimulus can be identified with sufficient accuracy or that conditions can be kept sufficiently constant to justify the assumption of a causal relationship between the stimulus the experimenter has chosen and the mode of behavior he subsequently observes on the part of the subject.

Trial-and-error Learning Questioned

The gestalt psychologists also came to question the trial-and-error theory of learning which had been advanced by the exponents of the reflex-arc concept. It will be recalled that learning had come to be described as the establishing of new neural connections between a given stimulus and a specific response to form what is called a *conditioned reflex*. This learning or conditioning process was described in Chapter 17.

Students of the history of psychology now say that the tendency among American psychologists to describe all learning in terms of trial and error may have resulted from their early experiments with animals relatively low on the scale of intelligence. Rats, chickens, and cats appear to have been the animal subjects most frequently used. Furthermore, the experimental situations—mazes and escape boxes—presented problems which could be solved

[10] *Ibid.*, p. 2.
[11] *Ibid.*, p. 4.

only by trial and error. That is, the subjects had to *guess* the specific pathway or the trick mechanism which the experimenter had built into his apparatus as the only possible solution. Thus, there was no clue by which a rat might distinguish between a right and a wrong alley except by exploration, and the only method that remained for him to solve the maze was the trial-and-error method.

A different kind of problem situation was employed by Köhler, who spent a number of years experimenting with apes on the island of Tenerife.[12] His experiments involved problems which might be solved in a variety of ways. That is, the apes were free to invent their own solutions because they could rearrange the objects in their cages in such ways that they could achieve their goals. Therefore, some of their rearrangements, carried out in what may be described as a permissive atmosphere, were not at all what the experimenter had expected. Furthermore, in many instances there was no evidence of a preliminary trial-and-error stage. The apes, quite typically, quietly studied the problem (usually one of securing fruit which had been placed out of reach) until a workable plan of attack occurred to them. Then they moved into action by rearranging the equipment in the cage in accordance with the scheme they had devised. There were few random movements or false starts. Though there were some failures because their plans were inadequate, it was not typical for a series of fruitless arrangements to be made before a practical one was hit upon.

Köhler concluded that these results pointed to a kind of learning that is better described as *insight* than as trial and error. Since that time, the concept of learning as insight has come to be widely held. It will be mentioned again a few pages later when we discuss the *field psychologies.*

Intelligence as a Fixed Capacity Questioned

The reflex-arc concept had also led to the theory that intelligence is the *capacity* to establish new habits or stimulus-response connections. Since these habits were said to be based on specific neural pathways, it was inferred that intelligence refers to and, indeed, is dependent on the number and variety of potential pathways available in the nervous system of the individual or organism and the speed with which these pathways can be established. The two factors—namely, the complexity and the modifiability of the central nervous system—were defined as physical traits. Hence they were said to be transmitted by parents to offspring rather than acquired in experience. Intelligence was therefore said to be determined by physical inheritance and to be constant for a given individual just as other inherited physical characteristics are said to be constant.

[12] Wolfgang Köhler, *The Mentality of Apes,* New York, Harcourt, Brace and Company, Inc., 1925.

Now that the reflex-arc concept was coming under criticism as a valid basis to account for mentality and learning, some investigators raised questions about the theory that intelligence is an inherited characteristic in the sense that it is said to remain constant for a given individual throughout his lifetime. Several of these critics conducted studies of the intelligence of children as determined by conventional intelligence tests. The children used in these studies were selected because circumstances not necessarily under the control of the experimenters had made it necessary for them to live under varying environmental conditions. Some of the studies involved identical twins, who, it is agreed, have identical inheritance since the two individuals are thought to have come from a single fertilized ovum. Usually, the two members of a given pair included in the studies had been separated at an early age and brought up in different environments. In some instances, the environmental opportunities of the two were judged to be equivalent. In other cases, the environments presented substantially different opportunities. Other studies were made of children living in institutions or in foster homes and of children who had been moved from one type of environment to another type by private arrangements.

These studies seem to indicate that children living in privileged environments tend to earn higher scores than do children from the less privileged environments. Children removed from homes which afforded only meager opportunity and placed in environments which offered better opportunities made higher scores than did comparable children who remained in the original limited environments. Children in institutions who were given enriching experiences, such as opportunity to attend a nursery school, surpassed other children in the same institutions who did not have those opportunities. In the case of identical twins, those who were placed in homes of higher economic and social levels were generally credited with higher intelligence.

Such facts tend to discredit the theory that intelligence is strictly an inherited characteristic. On the contrary, environment seems to play an important part in determining an individual's subsequent ability to cope with the problems of life. It follows that the improvement of environmental opportunities through education may be a matter of the greatest social importance. After spending years in the examination of such data, Stoddard wrote: "It can be predicted with some confidence that when homes and schools give the child what he truly needs, at all ages from the first year upward, there will be a radical revision in the norms and standards for mental tests." [13]

[13] George D. Stoddard, *The Meaning of Intelligence,* New York, The Macmillan Company, 1943, p. 392.

Localization of Function Theory Questioned

Still another inference drawn from the reflex-arc concept is known as the *theory of localization of function*. According to this view, each habit and each mode of behavior is thought to be dependent upon a specific physical structure and is said to be lost if the structure is destroyed, as in the case of disease, accident, or surgery. The loss of specific functions experienced by individuals who have suffered paralytic shock would tend to support this theory.

More careful study, however, has yielded a substantial body of evidence to the contrary. One experiment by Lashley is of particular interest. A rat was trained to select food from the more brightly lighted of two alleys. After this mode of response had been firmly established, enough of the rat's brain was destroyed that it could no longer respond in the way it had learned. The nature of the damage was such that the rat could not turn to the left. But since it was necessary to make three left turns to get to the food, the rat solved the problem by rotating to the right 270 degrees each time a left turn was called for.[14] Apparently, therefore, the rat was still able to solve the problem of getting food from the right alley—the mode of behavior it had learned before the brain tissue was destroyed—and was able to substitute a suitable mode of physical adaptation without recourse to trial-and-error learning.

From this and numerous other studies, Lashley was led to conclude that habits are not dependent upon specific neural pathways. He found ample evidence to convince him that a simple habit may be retained after the destruction of *any* given third of the cortex. Apparently it makes very little difference which portion is destroyed. On the other hand, the *amount* of brain tissue left uninjured is important. Lashley's conclusion definitely seems incompatible with the theory of the localization of function which the reflex-arc concept had led some psychologists to assume.

Concept of Simple Habits Questioned

A few pages back, we referred to the questions raised by gestalt psychologists and others about the practice of treating stimuli as independent entities, unvarying in their influence upon behavior. In contrast, a new theory was advanced which held that a stimulus is the interpretation the subject

[14] K. S. Lashley, "Studies of Cerebral Function in Learning: III. The Motor Area," *Brain,* vol. 44 (1921), pp. 255–285. For a review of this and other studies on the localization of function, see Raymond Holder Wheeler, *The Science of Psychology,* New York, Thomas Y. Crowell Company, 1929, chap. XVII.

gives to the elements in his environment and that this interpretation has reference to the total situation and not merely to specific elements in it. This is an important distinction, for if a specific element may be interpreted in a good light in one situation and in an abhorrent light in another situation, there obviously can be no such specific and unvarying connections between stimulus and response as the reflex-arc concept led us to assume or as is implied in the earliest concept of a simple habit.

In 1915, Köhler, whose experiments with apes were mentioned earlier, reported that he had trained chickens to respond to the brighter of two colors—for example, a lighter and darker gray.[15] It follows from the reflex-arc hypothesis, however, that learning to respond positively to one of the colors will of necessity result in learning to reject the second color. The rejection of, or negative response to, the second color should become so well established by the time the positive response to the first color has been fixed that the chickens would reject automatically the second color whenever or wherever it is encountered. Yet when Köhler presented the second or negative color with a third shade of gray still darker than the second, the chickens now accepted the second or negative color in a positive way.

Other studies, some of children and others of young apes, indicated that they too could pick out the *relatively* larger or the relatively smaller objects in various combinations, and that neither positive nor negative reactions were connected with a specific size. From such evidence, Köhler concluded that[16]

> instead of reacting to local stimuli by local and mutually independent events, the organism reacts to an actual *constellation* of stimuli by a total process which, as a functional whole, is its response to the whole situation. This is the only viewpoint which can explain how to a given local stimulus there may correspond altogether different experiences as soon as surrounding stimulation is changed.

The Field Concept

The terms *total process, a functional whole,* and *whole situation* which appear above have considerable significance. They suggest that specific elements in a given situation are not connected mechanically with a fixed and unvarying meaning acquired in an earlier situation but are endowed with qualities relative to the total situation in which they are found. These relative properties cannot be accounted for by reference to machine principles. Rather, they appeared to Köhler, who had received extensive training in physics, to be more nearly akin to the manner in which energy fields in-

[15] Ellis, *op. cit.,* pp. 217–227.

[16] Wolfgang Köhler, *Gestalt Psychology,* New York, Liveright Publishing Corporation, 1929, p. 106.

teract. The concept of interacting energy fields, which is substituted for the reflex-arc concept of the connectionists and behaviorists, is the basis for the *field psychologies.*

Köhler believed that psychological theory based upon the reflex-arc concept had resulted from a too close adherence to the analogy of special physical systems, such as a closed electrical circuit or a drop of water moving through a pipe. He pointed out that a drop of water is caused to move through the pipe by dynamical forces. It is restrained from moving in any direction other than forward by the walls of the pipe itself. The walls of the pipe determine the direction by permitting force to act upon the drop of water from one direction only. These restricting or direction-giving conditions Köhler labeled *topographical* factors. The moving force, on the other hand, he called a *dynamical* factor.

Now, Köhler went on to say, let us think of the drop of water together with the whole column of water in the pipe as part of a larger volume of water. If it could retain its identity, the particular drop would also probably move about in its new environment. But now it would be exposed to pressures from every direction, and its movement, accordingly, would be "in the direction of the *resultant* vector of force." In this unrestricted environment there would be no mechanical arrangement to force the movement in one direction only, and the path of the drop would be "determined *dynamically*—by resultant force at each moment." The direction the drop takes at any given moment would depend upon the "dynamical situation it encounters at each stage," and the direction would change whenever the situation itself changed. In this instance, as in many others, movement, process, direction, and distribution of process are *determined dynamically by interaction.*

Köhler pressed the issue further by pointing out that the dynamics of interacting forces have generally been ignored when we have thought about machines and their operations. Thus, when we began to reason about the behavior of living organisms from machine analogies, we were trapped into excluding dynamical considerations from standard neurological and psychological theory as well. This he believed to have been an unfortunate error, and he set out to include such considerations as fundamental elements in the structure of gestalt psychological theory.[17]

A New Concept of Habit

Köhler's suggestion that behavior is determined by dynamical interaction and not by mechanical processes brings to mind some characteristics of electromagnetic fields. Presumably, every student who has been exposed to

[17] *Ibid.,* pp. 134–135.

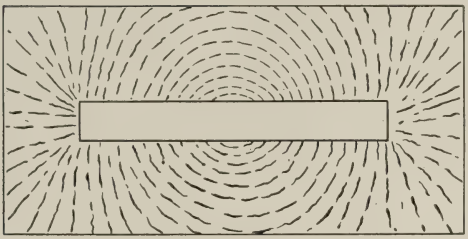

Fig. 69. (*a*) A magnetic field surrounding a single bar magnet. (*b*) A magnetic field created when the positive poles of two magnets were placed near each other. (*c*) A magnetic field created when the positive pole of one magnet was placed near the negative pole of a second magnet. Note the appearance of a dividing line between the two opposing patterns in *b* above. This could illustrate the appearance of the sensory experience of hardness as when we touch a hard surface, according to the theory of perception derived from certain field psychologists. Where is the surface, or the quality of hardness, when only one magnet is present? Is the second magnet needed to create it? Might living organisms contribute in a similar manner to the creation of the sensory experiences they undergo?

elementary general science is familiar with the field of energy made visible by placing a sheet of paper over an ordinary bar magnet and scattering iron filings on the paper. The immediate organization of the filings into a regular pattern of lines is a startling spectacle to those who witness it for the first time. The original pattern, however, is quickly reorganized to form a new pattern if an object like a paper clip or a nail is placed near the mag net. When a second magnet is brought within the vicinity of the first magnet, the changes in the pattern are even more dramatic. Furthermore, one particular type of pattern appears when the north pole of the second magnet is presented, but an entirely different pattern appears when the south pole is presented. Finally, the precise details of the several patterns are visibly altered if a third magnet is brought into the field.

It should be noted that each pattern appears as an orderly arrangement. In commenting upon this fact, Köhler said, "Dynamical interaction, undisturbed by accidental impact from without, leads to orderly distribution, *though there are no special preestablished arrangements.*"[18] It is the tendency to establish orderly arrangements, arrangements which under similar conditions may appear on the surface to be quite similar, *even though never identical,* that is implied by the term *habit.* The tendency toward similar behavior rather than identical behavior indicates that the concept of habit entertained by field psychologists cannot be characterized as mechanistic.

The suggestion that two successive responses to what appear to be the same stimuli are never identical—that a habit is not repeated identically in successive situations—may call for further explanation. Let us assume that each of the magnets in the above account has a field of its own with its own unique characteristics and potentialities. This, we are assured, is a reasonable assumption. It may also be assumed that the pattern of the field which appears at a given time is determined in part by interaction with other fields. In a real sense, however, the terminal boundaries of a given field are difficult, if not impossible, to establish, and every field is in reality an integral part of a single, all-inclusive field. This factor may have bearing on the psychological principle current today that the individual cannot be insulated against all environmental influences.

The manner in which the individual is now said to be in continuous interaction with the total environment may be illustrated by reference to the behavior of the needle of a magnetic compass. The needle is, in fact, a free-swinging magnet. Its tendency to point in a northerly direction may be called a habit. We understand, of course, that it points to the north as a result of the interaction of its field with the field of the earth.

But this behavior on the part of the needle is not a mechanical and invariable form of response, as any experienced navigator can verify. In the

[18] *Ibid.,* p. 139. Italics supplied.

author's experience, the presence of a steel fishing rod in the cabin of a small boat has affected the compass sufficiently to present some serious navigation problems. Nor is the earth's magnetic field constant and therefore completely predictable. Since the magnetic pole, the point to which the needle of the compass points, is located *near* the geographical North Pole, it is suitable for many of our purposes to think of the two poles as identical at all times. However, intercontinental ships and planes dare not act upon this assumption. Not only must the difference in the location of the two poles be taken into account but also it is necessary to correct periodically the location on the navigation charts of the magnetic pole in relation to the geographic pole. This is true because the magnetic pole seems to have a habit of moving about. Though the records will show what its location was on a particular date in the past and scientific instruments may help us determine what its position is as of this moment, it is impossible to predict exactly where it will be on any particular date in the future. The needle of the compass will, in all probability, point toward the north magnetic pole on any future date, but the pole will not be in the same place with reference to other fixed points on our horizon that it was yesterday or is today.

The general tendency of the needle to point in a northerly direction may be likened to a habit, say the field psychologists. But it must be understood that each reading is a distinct and, to a degree, a unique achievement, the result of the resolution of particular forces which are operating in a particular manner at that particular time and place. It is in this same sense that each act, no matter how familiar the circumstances in which it occurs, is now said to be a distinct and, to a degree, a unique achievement.

Incidentally, astronomers are now inclined to describe the behavior of the celestial bodies in terms of dynamical interaction also. The celestial system, too, has, at a given moment, the appearance of organization and regularity. Each body moves in its orbit with such apparent regularity that Newton was led to believe that the orbits are fixed and invariable. Only recently have improved instruments and techniques of observation produced new data leading to the belief that the universe is expanding. The relations of its several parts, including those in our own solar system, are for that reason not completely predictable. This may have some bearing upon the fact that we are unable to predict the whereabouts of the magnetic pole.

To say that a given future state of a dynamical system is not completely predictable does not mean that it will lack order. The particular order or organization that will exist at a given time will be produced by the interaction of forces operative at that particular point in the development of the total field. And what, actually, is the explanation of this general tendency toward order in undisturbed dynamics? It appeared to Köhler to be simple enough, for in any given system of interacting forces, at any given

point, and at any given time there can be but one resultant. The elementary principles of physics should lead us to conclude, therefore, that, *"for the system as a whole,* the immediate effect of all those forces will have one definite direction." The resolution of the forces brings an orderly arrangement because "the totality of internal stresses will be more balanced than in a state of disorder." A system approaches order, therefore, as a consequence of the undisturbed interaction of the forces out of which it is formed.[19]

Summarizing briefly, we are led to understand from the foregoing abbreviated account taken from Köhler, as well as from the other accounts reviewed above, that the field psychologists in general reason about behavior and its causes from a different analogy from that of the association psychologists. To the field psychologist, the living organism *and* its environment are best understood when each is thought of as a dynamical field. The two fields interact and form a larger field within which all the forces are resolved dynamically and not mechanically. Dynamics imply potentiality for a change of direction, for taking into account and even for bringing about new conditions which will have their effect in producing not completely predictable results. That is to say, there is inherent in the interaction of energy fields a potentiality for producing new relationships which is akin to the ability of the intellect to produce new ideas, the phenomenon which James had recognized earlier and had attributed to cerebral instability.

Continuing to reason from the analogy of interacting energy fields, we find that the concept of habits as fixed, mechanical processes which are repeated without change as often as the stimulating causes are encountered, now gives way to what Dewey called a coordination, Köhler described as a resolution of dynamical forces, and Cantril defines as a transaction. A so-called "habit" is unique to a given time and place and the then-existing status of the interacting fields. When both the environment and the reacting organism are regarded as dynamical energy patterns in process of continuous change, it is clear that though behavior may be similar in successive situations it presumably cannot be identical. Habit, therefore, has come to have the connotation of similarity and not that of identity. It is the necessity to act in each situation as though it were a new situation—which in fact it is—that keeps us from being mere pawns pushed about by forces that are external only. What we are, what we hope to be, what we believe we ought to be are now recognized as forces that also help determine what we can or what we will be. This concept lends new meaning to the dignity of man.

[19] *Ibid.,* pp. 139–140.

Learning as Insight

The adaptive advantage is now seen to lie with the individual who is able to resolve new situations and not with the one who automatically repeats habits fixed earlier in life. Whereas habits were once thought of as responses given to isolated elements or combinations of such elements identified in the environment, field psychology now insists upon regarding them as adaptations with reference to total situations, situations within which even familiar elements may acquire new meanings for us because the conditions under which they are encountered have changed. The ability to resolve a total situation in light of the conditions present in it as well as the purposes and aspirations the responding organism carries with him is what was referred to a little earlier as *insight*. It will be recalled that Köhler believed he had found evidence of insight among the apes who resolved problem situations by rearranging their environments in line with plans of action which they formulated *before* they went into action.

Köhler's studies helped bring about a new interpretation of the learning process, an interpretation that has been accepted quite generally by the field psychologists and by educators who rely upon the field theory. As a consequence, teaching is now coming to be looked upon as the progressive development of the learner's ability to *organize* his problem situations *in a mental process* in advance of taking overt action. The learner gives evidence of having developed such ability when he is able to take effective steps in the problem situation without engaging in preliminary trial and error. Insight is achieved in a preliminary pause for reflection during which the environment is reorganized "in the mind" to bring about an arrangement that is more satisfactory than the one which now exists. The reorganization, therefore, must be regarded as a creative act, an act that brings about an arrangement which did not exist before. This is in keeping with the concept of mentality suggested by James and Dewey as the creation and testing of new ideas.

Though this type of creative thinking may produce striking recombinations of previous experiences and present perceptions, it frequently proceeds in a gradual and relatively even manner. The solution of routine mathematical problems is a case in point. But now and then a situation is encountered which fails to yield to this normal and regular attack. In spite of the most systematic approaches, a solution does not occur until in a moment of startling rearrangement an entirely new relationship is seen in which the solution comes most readily. "It is . . . sudden restructuring which gives the subjective experience of insight."[20] Hilgard cautions us

[20] Ernest R. Hilgard, *Theories of Learning,* New York, Appleton-Century-Crofts, Inc., 1948, p. 346.

that, since understanding and inferences may be used in unsuccessful solutions as well as in successful ones, the flash of insight is evidence not of unusual heights to which intelligence has soared but rather of the apparent aptness of the solution when it first occurs to us. We may conclude, however, that the process of restructuring which enables us to bring about the new arrangement, the process we have labeled insight, is essentially the same in the undramatic as well as in the more dramatic situations. That is to say, insight is achieved in many instances—probably even in most cases —without an accompanying subjective experience of marked elation.

The impact of the insight theory of learning upon educational practices has been a substantial one. "The restoration to sanity represented by the insight experiments gave new hope to teachers and others who saw thinking and understanding returned to respectability." [21] Further note of the insight theory of learning will be taken later in this chapter when we discuss the role of experience in learning.

Learning as Growth

Field psychology received both support and further direction from the work of Raymond Holder Wheeler and his colleagues. Whereas the gestaltists had been influenced in their thinking by new developments in physics, Wheeler was inclined to borrow suggestions from such biologists as Driesch, Spemann, and Coghill.[22] Research with embryos of sea urchins and amphibians had shown that the specialized role or function of a given cell is determined not by its antecedents but by its location in the organism. That is to say, cells transplanted from one part of the embryo to another take on the appearance and function of the part to which they have been transferred. Thus, cells originally destined to grow head structure now produce tissue that forms a leg, or vice versa.

Now it was inferred that each organism has its dynamic pattern, or *organizer,* which exerts its control over the several parts from the very beginning of the organism's independent life. It is the organizer that coordinates the development of the several parts and directs adaptation to environmental conditions.

It follows, Wheeler concluded, that the organism as a whole is primary. It always reacts as a whole and maintains its integrity as a unique, coordinated living unit at each stage of its development. The organism's specialized structures and functions emerge gradually out of the basic structures and functions. We can see that in this insistence upon the primacy of the

[21] *Ibid.,* p. 179.

[22] For a brief summary of these contributions, see *ibid.,* pp. 234–237.

whole Wheeler is in complete agreement with the gestalt psychologists when they speak of total processes and whole situations.

There was another aspect of the biologists' research that impressed Wheeler very much. That aspect was the role apparently played by the organizing principle in foreshadowing developments that result in new forms of behavior. Coghill and others had found that certain kinds of behavior common in adults of a species do not appear, and, indeed, cannot appear, in the young. That is to say, behavior is, to a degree, dependent upon structure and is therefore not possible until the organism has developed the particular structure necessary for that form of activity. On the other hand, when the structure has emerged and is ready to function, the corresponding mode of behavior is also likely to appear.

These conclusions so impressed Wheeler that he tended to equate learning and growth. Hilgard commented as follows: [23]

> The order of new coordinations in the developing embryo is a matter of growth, foreshadowed in anatomy before the behavior appears. Thus a muscle begins to grow and a nerve begins to grow toward it. Not until they are in contact does the muscle function. But this function was already laid down in the pattern of growth. The growth pattern thus anticipates behavior. Many things which might appear to be learned are actually the products of growth.

Age Maturation

According to Wheeler, there is a type of learning that is an outgrowth of the maturation of the organism itself. Birds fly and human infants walk when they have achieved the necessary physical development. The new forms of behavior appear without formal training. In fact, studies have shown that, in the case of walking, any coaching given human infants before the time they are ready to walk is largely wasted effort.

Learning which is the product of growth itself Wheeler called *age maturation*. Its significance for the teacher is evident from the emphasis that is now given to research in child development and to the rescheduling of learning activities to make them conform more closely to the child's state of readiness to learn them. There is ample evidence to support the claim that for many years schools as well as parents have wasted much effort and may have done injury to children by insisting upon prematurely teaching modes of behavior that would have appeared without much effort if the instruction had been delayed a few months or even years.

[23] *Ibid.*, p. 237.

Stimulation-induced Maturation

There is yet another aspect of Wheeler's concept of growth which has great educational significance. Thus far, we have considered the kind of maturation or development which he said takes place simply because the organism is getting older. It is this type of age maturation that accounts for the appearance of the walking or talking activities in the human infant. But the geographical location and the social environment in which the walking and talking activities take place also have their effect upon the learning that occurs. Thus, a mountaineer's child will learn to walk on rough terrain. He will develop anatomical structures that enable him to travel safely and without fatigue over obstacles that seem insurmountable to the city-born. As an adult, he will reveal by his gait his mountaineer background even when he is walking on the smooth pavements of the city. Similarly, the child of German parents will learn to talk at the proper stage in his development, but he will develop the physical structures and controls that lend a gutteral quality to his speech.

Growth that is promoted by environmental factors Wheeler called *stimulation-induced maturation*. Obviously, it is this type of growth which the school can promote and direct with most profit.

Pacing versus Drill

The concept of education as growth induced by selective stimulation has yet another implication for education. The very nature of biological growth suggests that time is needed for the organism to develop the specialized structures and functions called for by the mode of stimulation provided. The time needed to allow growth to take place is the point to bear in mind. That is to say, the learning effort needs to be spread out over a period of time to allow for the necessary growth to take place. The deliberate attempt to space the learning efforts to take advantage of growth between attempts is called *pacing*. It is in sharp contrast to the theory of massed drill offered by the connectionists and behaviorists.

The results of recent research tend to support Wheeler's views on this matter. They indicate that it is not the number of times that an act is repeated that determines the degree of effectiveness with which it is performed—as was assumed from the reflex-arc concept—but rather the total amount of time that has elapsed after stimulation has been started. The studies show that when stimulation is spaced to allow the learner to grow into the new pattern of behavior his progress is equal to and sometimes greater than that of equally able learners who have been given substantially more drill but in greater concentrations.

The conclusion drawn from these studies is that "for any given learner, the rate of improvement in a specialized perceptual-motor function, within wide limits of practice and rest correspond more nearly to the total time elapsed from the beginning of practice than to the fraction of this total time spent in practice." [24] The time between practice sessions, therefore, seems to be just as necessary and just as important as the time spent in practice. This is not what we had been led to conclude from the reflex-arc concept.

The Role of Experience

Summarizing briefly, we have seen that both the gestalt psychologists and the *organismic psychologists,* as Wheeler and his colleagues came to be called, reject the reflex-arc concept as an adequate basis upon which to build a scientific theory of behavior and learning. Both agree that the whole individual and the total environment are involved in every learning-responding situation. Each individual is said to be endowed at birth with his own unique organizing principle or dynamical life pattern. The interaction of this pattern with the environmental field accounts for the first acts that indicate that a new individual is now on the scene and must be regarded as such by all others.

But, in all but the lowest forms of life, the initial pattern does not continue without change. Whether we think of this change as induced by the interaction of energy fields or brought on by maturation, the individual will become, in effect, a different individual from the one he was initially. Therefore, he will no longer interpret the environment as before, and his subsequent behavior will also be different. In some cases, his subsequent behavior will lead to the rearrangement of the environment to make it a different environment. It is the changes in the individual which enable him to utilize personal and environmental resources more effectively, to project new purposes, and to use the resources to achieve them that are implied by *learning.* The ability to project new arrangements, to reconstruct the environment to bring about desired consequences, is called *intelligence,* and it is the result not of the activation of preexisting neural pathways but of the psychological phenomenon of *insight.*

The concept of the individual as a dynamic organism, one that has inner potentialities for change as well as for responding to external influences, suggests that the ability to fashion a better life may be developed, that insight and, consequently, intelligence can be improved. Something of this nature was implied in the theory of stimulation-induced maturation discussed pre-

[24] *Ibid.,* pp. 250–251. See also pp. 250–257 for a review of the studies on which this conclusion is based.

viously, as well as in the effect of experience on perception which was called to our attention by the gestalt psychologists. The latter insisted from the beginning that in perception we do not *see* a photographic representation of the field of vision but that we *interpret* it as threatening us with consequences which we definitely do or do not wish. When the anticipated events are not to our liking, we recognize a problem, and we strive somehow to make the situation present us with a different, more acceptable prospect. This can be done only by restructuring the situation. A conscious effort is made to reconstruct it, and the result, if the effort is successful, is a new interpretation. A new goal is thus made to appear which points us to a different, more promising course of action than the one we anticipated earlier. The new perceptual interpretations "are not photographic, nor are they simply revivals of past experiences. They are perceptual *achievements* molded out of past experience and present sensory discriminations."[25] This is constructive thinking, thinking in which we do not submit to things as they are but seek to make them over into a pattern that suits us better.

A New Concept of Intelligence

Obviously, what the individual has experienced, how he has matured and been changed by previous interactions with his environment, may have a substantial bearing upon how adequate his present insight may be or how readily it comes. The effect of experience on learning has intrigued psychologists for some time. They have noted that the learner's familiarity with problems of the type he now has before him may have a direct bearing upon how quickly he recognizes what is called for as well as what consequences he may expect from the several lines of action he sees open to him. The ability to recognize what is called for and to take appropriate action is, according to the psychologists, an indication of learning and intelligence. A psychologist's estimate of a given individual's learning ability (that is, his intelligence) may therefore be determined, at least in part, by the individual's previous experience with the materials used in the test situation. If so, the test score should be interpreted, *in part,* as an indication of the subject's familiarity with the test materials rather than as an indication of inherited capacity.

As early as 1929, Lashley suggested that in psychological experimentation the subject may frequently be responding in terms of the experimenter's movements, the nature of the experimental apparatus, and other cues before he finally pays attention to the test cue itself. The responses which are irrelevant to the test situation as it has been structured by the experimenter are

[25] *Ibid.,* p. 345.

then either ignored or judged to be indications of stupidity. Köhler also admitted this possibility and suggested that if those same responses could be judged from the subject's point of view they might be found to be logical enough, and they might represent a very significant form of learning which occurs before the test problem itself is attempted.

Krechevsky made a study of this so-called "presolution learning" and its possible effect upon the subject's ability to deal with situations involving that same test material when it is encountered later. He found that the subjects used in his experiments did respond initially to other cues than the ones intended for them. It is apparent, therefore, that experimenters not alerted to this fact are likely to list as errors responses of their subjects which have no relationship to the problems that have been set up for them. Krechevsky also found that subjects given an opportunity to explore the test apparatus before subjecting them to the test problem itself made fewer errors and mastered the problem in fewer trials than did subjects that had been given no presolution experience.[26]

From evidence such as this, field psychologists have been led to conclude that there is a significant relationship between past experience and the ability to cope with problem situations which an individual may encounter later. The exact nature of the relationship and the precise degree of influence upon subsequent ability, as well as the basic reason for the relationship, are still matters that call for further study. In this connection, new efforts are being made to study the transfer-of-training hypotheses advanced by earlier schools of psychology. The attention these efforts are attracting in the current professional periodicals indicates something of the interest the above questions have aroused in psychological circles in recent times.

Among educators, the work of Krechevsky and other field psychologists has tended to support the newer methodologies developed in response to hypotheses suggested by Dewey, William H. Kilpatrick, and other early leaders in the so-called *progressive movement*. The newer instructional practices have come to make extensive use of exploratory experiences, developmental activities, and new curricular patterns based upon projects and the experience units in general. Educators have also come to doubt the justice of matching on a one-to-one basis the pupil's educational opportunity and his intelligence-test score. There is a corresponding inclination to interpret test scores, of both the aptitude and the achievement types, as measures of the adequacy of previous experience rather than as indications of the limits of future development. Accordingly, the demands of justice call for a special effort to correct deficiencies rather than to compound misfortune by keeping

[26] I. Krechevsky, "A Study of the Continuity of the Problem-solving Process," *The Psychological Review*, vol. 45, pp. 107–133.

the pupil of low achievement in an impoverished and unchallenging environment. The effort to expand and enrich the educational experience heretofore provided the slow learner is not intended to be made at the expense of the average and the gifted children. Rather, it calls for a better balance in the total program and closer attention to what is appropriate learning activity for each child. Further reference will be made in the following chapter to the educational developments that have followed from the psychological considerations briefly described here.

CHAPTER 21

LEARNING TO CONSTRUCT KNOWLEDGE OF THE GOOD

The story of the educational changes growing out of the theory that knowledge of the good is neither received nor discovered but is constructed out of the material gathered in experience remains to be written. Even now the changes called for are still in the process of being worked out. Consequently, the present status of even the most forward-looking educational practices must not be regarded as a final stage in their evolution, and the trend for the future presumably is not entirely clear. We are justified in assuming that only a beginning has been made to date and that the major part of the transformation that is called for may still lie ahead.

There is a feeling, however, that the changes recently introduced in our schools in response to the newer philosophical and psychological developments, though not final, are already sufficiently extensive to merit attention. Certainly, the furor raised as segments of the public have discovered that their children are not now being taught the identical subject matter that was taught a generation ago, and that the methods of instruction are also unfamiliar, leads us to believe that something is astir in the pedagogical world. It is our present purpose to take a quick look at some of those developments.

Authoritarian Background of Modern Education

From the very beginning of this book, we have defined education as the effort individuals and communities make to transmit to their young those things which they believe contribute most to the enrichment and security of life. The close relationship that should logically exist between philosophical theory and educational practice has been noted. It has also been apparent

from our review of developments in Western philosophy and education that all but the most recent philosophical systems assumed an authoritarian basis for knowledge of the good. Accordingly, educational efforts were directed toward *imposing* the beliefs, arrangements, and practices held by the older generation upon the younger. Children were molded to conform to the traditional way of life, and usually the great majority of them were taught to obey and be subservient to the leadership of a selected few. The effect of instruction upon the instructed was that of restricting the creative impulse on the assumption that the child is by nature destructive, if not altogether evil. Accordingly, educational activities consisted in large measure of memory work, imitative exercises, repetitive drill, and practice in giving immediate obedience to command.

We also reviewed in the preceding chapters the gradual development of a distinctly new way of life, particularly the one that grew out of the social experiences gained on the American frontier. The philosophy of the frontiersmen was not readily translated into educational practice because it emerged by very slow steps over a long period of time. In contrast, the American system of public schools was introduced almost overnight, once the people were committed to it. These schools followed patterns and utilized curricula borrowed from abroad. Though the borrowed forms had been designed to serve authoritarian ends, they took root quickly and became entrenched in the loyalties of the people primarily because they were looked upon as important aids in transmitting to children the private beliefs held most strongly by their parents at that particular time. We recall in this connection that a large percentage of the American settlers came here to escape the imposition of beliefs and practices which ran counter to their own convictions. Consequently, their personal religious and philosophical commitments were strongly held, and they insisted that their beliefs and no others must be taught their children. As a result, their educational institutions were closely identified at the beginning with the home and the parish.

The record shows that the great variety of privately held beliefs led to the multiplication of schools and to a considerable duplication of educational effort that persisted for nearly two hundred years. When in the interests of economy of money and effort a common school system was achieved, it was made possible only by mutual agreement to exclude matters of private belief and conviction from the curriculum. The common schools—common in the sense that they might be attended by any child without fear that they might violate parental desires in matters of belief—were designed to transmit only the elements of learning held by all to be useful to each. Political opinions, religious beliefs, and fundamental philosophical assumptions were excluded from consideration because instruction in the areas characterized by personal differences was reserved to the home and the church. And as we

have already seen, the personal commitments of those who migrated to America were based on authoritarian principles.

A number of developments are related to this arrangement of dual responsibility in educational matters. Thus, the concern of the home and the church in matters of belief is responsible in large measure for the principle of local responsibility and control which is characteristic of American public education today and which is in sharp contrast to the principle of central control found almost universally elsewhere. Perhaps the principle of separation of church and state was also derived more directly from the desire to keep religious instruction in the hands of the home and the church than from any other single source.

Constructing Knowledge in the Frontier Community

What seems not to have been widely recognized at the time, even by the people who led the fight to bring it about, was the fact that the common school, like the emerging community life around it, was made possible only because it was agreed by everyone to subordinate private beliefs and commitments, when necessary, to agreements worked out by cooperative efforts in a process of intellectual construction. This agreement became central in the emerging community life, and it lends significance to our present devotion to the principle of religious freedom on the one hand and to the principle of separation of church and state on the other.

The need to educate the young was not the only area of common concern discovered by the early settlers, nor was it necessarily the first such area discovered. Individual interests also were found to overlap in the need to protect life and property, to maintain peace, and to promote the exchange of goods and services. Such concerns were found to be common—to be shared by all members of the geographical community—regardless of the variety of personal convictions that may have existed regarding the manner in which those problems should be solved. That is to say, the geographical communities became genuine social communities when the inhabitants discovered that they had a community of interests in spite of their differences in beliefs. *They became uniquely American communities when they learned that they could deal effectively with such shared concerns, whatever the area, when they employed a different kind of problem-solving procedure from those traditionally used in the home and the church.*

The experiences born on the frontier led Americans of philosophical training and disposition—notably James and Dewey—to intellectualize the process by which the community life was carried forward. From their studies they were led to propose a new philosophical principle. Thus the form of community life born on the American frontier was not only the inspiration

which called forth the new philosophy but was also its best exemplification. In brief, *the American way of life is an example of how the philosophy that knowledge of the good is constructed has been translated into action.*

Community and School Lose Contact

Unfortunately, when this fact became fully recognized, the common, or public, schools were already so deeply engrossed in teaching only the elements of reading, writing, arithmetic, and the natural and social sciences that they were not prepared to deal with the values and skills the new way of life required. The lack of communication which grew up between the schools and the communities became more serious as time went on. Thus, while the schools were continuing to teach in the tradition of the authoritarian philosophies, the parents of the pupils were developing new skills and competencies in the use of the evolving method for dealing with common problems. In contrast to the emphasis that came to be given in some of the schools to locating and developing an intellectual elite, the supporting communities were learning to value each individual and to guarantee each one the right to be guided by the light of his own convictions. While the schools were teaching the right answers, the communities were learning that it is unwise to give special privileges or status to any individual or opinion. The pupils learned to consult authority, but parents were coming to judge ideas in the light of their consequences. Each opinion, each idea seriously offered in the councils of the community was beginning to receive ever more serious consideration. And no matter how strongly private opinion might be held, it was coming to be recognized that community life is possible only when such opinion can be subordinated to the judgment of the majority when conflict occurs between the two.

In brief, the settlers in the new land, regardless of what they had been taught in their homes, their churches, or their schools—settlers who as individuals had been brought up in the traditions of authoritarian philosophy —were now developing a way of life which took as its authority nothing more absolute or final than the will of the people themselves. Out of this commitment to the principles of popular government there developed a form of community life in which study, deliberation, and a due concern for consequences made possible the construction of new and frequently better arrangements than those already in existence either here or elsewhere. But the content of education, even that of the new system of public schools, seems to have remained indifferent to this fact.

The lack of contact between the emerging community life and the traditional program carried on by the schools aroused no special concern as long as the conditions of the frontier community prevailed outside school.

As long as ours was essentially an agrarian economy and children were growing up in neighborhoods where persons of different backgrounds and outlooks were nevertheless closely associated in matters of common interest, the schools were not called upon to make a special effort to teach those understandings and skills which were taught so effectively in the community itself.

By the beginning of the present century, however, various thoughtful individuals were pointing out that the simple, self-sufficient agrarian community was no longer typical. Large population centers had developed, and enormously complicated industrial and commercial organizations had replaced the community-contained enterprises of a previous era. Therefore, the essential principles of popular government and of shared ventures were no longer capable of being learned adequately by youth through direct observation and participation alone. Furthermore, much of the expansion in government and industry had been fed by recent immigrations. The new arrivals had not undergone the transforming experiences of frontier life and were thus acquainted only with old-world philosophies and social practices. Whatever the motives which had brought them here, the immigrants as a group had not learned the ways of the life born on the frontier or developed loyalties to the unique moral and spiritual values upon which the success of a free society is dependent. It is for such reasons, said the educational reformers, that the American communities can no longer remain indifferent to the need to transmit their way of life and must now give serious thought to utilizing their schools in this important enterprise.

This, then, is the issue that is central in the current conflict between those who would cling to traditional forms of education and those who urge reform. It is the issue which led Dewey and his followers to call upon the schools to assume their social responsibilities. There is evidence that numerous communities throughout the country have become alert to a need for reform and are taking steps to deal with that need.

Early Educational Reforms

Meyer has traced one root of the modern educational-reform movement back to the theories of natural development and freedom for the pupil advocated by Rousseau.[1] These theories were described in some detail in Chapter 10. We must be careful not to regard Rousseau as an exponent of the theory that knowledge of the good is a product of the creative powers of human intelligence. His insistence upon freedom for the learner arose from his belief that the seeds of knowledge are implanted in the soul of man

[1] Adolph E. Meyer, *The Development of Education in the Twentieth Century,* 2d ed., Englewood Cliffs, N.J., Prentice-Hall, Inc., 1949, p. 7.

by his Creator and that those seeds must be allowed to spring up without suffering distortion at the hands of well-meaning but misguided human beings. Here were found some of the first suggestions that physical activity, direct contact with nature, useful work, and free play might be employed with profit in the educative process. The new directions pointed out by Rousseau soon came to be followed by Basedow [2] in his development of manual-training types of instruction; by Pestalozzi [3] with his sense-teaching methods and his kind and even affectionate attitude toward his pupils; and by Froebel [4] and his belief in the possibility of developing moral character and understanding through play activities and contact with symbols representing principles of cosmic perfection. It was from the work of Froebel that the kindergarten and the play school movements acquired their initial momentum.

Important aspects of the Pestalozzian and Froebelian innovations were brought to America by a number of leaders in the public school movement which was getting under way in the nineteenth century. Not the least of these leaders was the phenomenal Francis W. Parker,[5] to whom American public education owes a far greater debt than historians in general have recognized. His work gained stature first when he was superintendent of schools at Quincy, Massachusetts, and later when he was principal of Cook County Normal School in Chicago. He labored fruitfully, even when strongly opposed, to transform the schools for which he had responsibility into institutions where children were treated as individuals who were endowed with human dignity and whose feelings, aspirations, and abilities were matters that had educational significance of the highest order. Wherever he went, the harsh, militaristic discipline imported earlier from Prussia and the emphasis upon subject-matter mastery typical of the schools of his day came under vigorous attack. In their place, he urged the adoption of the gentler, more kindly methods introduced by the Swiss educational reformers. Subject matter was given a child-centered orientation with emphasis upon utilizing pupil interests for motivation and upon directing learning to its practical applications in order to develop a better understanding of what was learned. His ideas and methods, including his activities in promoting the newly launched parent-teacher organization, are strong reasons for listing him as the first American pioneer in the modern school movement.

Parker lived long enough to see and applaud the laboratory school founded by John and Alice Dewey in Chicago at the close of the nineteenth century.[6] Dewey had been led to reject on philosophical grounds both the

[2] *Ibid.*, pp. 9–11.
[3] *Ibid.*, pp. 11–17.
[4] *Ibid.*, pp. 23–30.
[5] *Ibid.*, pp. 30–35.
[6] Harold Rugg, *Foundations for American Education,* Yonkers, N.Y., World Book Company, 1947, p. 543.

foundations of the Herbartian methodology which was then sweeping the country and the mechanistic views of learning which were being put forth by the emerging school of physiological psychologists. Even at that early date, Dewey seemed to be reaching for the dynamical interpretation of growth and learning which is so much in evidence in his later writings. In any event, he led the way in developing an educational program in which the child is looked upon as an individual who is in the process of growing from his initial status of immaturity, insecurity, and ineptness into a confident and competent adulthood. Unlike Rousseau, Dewey was not willing to leave the process of growth to nature and the passing years. He believed that it must be directed by carefully selected activities that afford successful interaction between the pupil and his social and physical environment. To this end, learning activities in the Dewey school were made to focus upon the study of occupations found in the out-of-school community; and life within the school itself was cast in the mold of a community in miniature with a full set of social controls which reflected those accepted in the adult community.[7]

The Dewey school in Chicago soon found itself in the company of other experimental schools which were being established throughout the country. Rugg has listed more than thirty such schools which were in operation before 1930.[8] Most of the schools were private schools. All of them were in revolt against the conventional forms of education, and their number indicates that a significant amount of unrest and dissatisfaction with the theories and methods of education then in vogue was building up. By 1918, a few leaders of this embryonic school-reform movement were meeting from time to time to exchange ideas and to lend each other moral support. By 1919, they were organized as the Progressive Education Association, and in that year they held a meeting in Washington, D.C., to which the public was invited. From that time to the beginning of World War II, the Progressive Education Association[9] was the foremost exponent of educational reform in this country, and its several leaders, committees, and commissions encouraged or conducted some of the most significant experiments in education and studies of experimental practices of our time.

Eby is quite insistent, however, that the direction given educational reform by Dewey on the one hand and by the Progressive Education Association on the other must not be confused.[10] That there is a distinction

[7] See John Dewey, *School and Society,* Chicago, University of Chicago Press, 1899, for a firsthand account of what was attempted in the Dewey school.

[8] Rugg, *op. cit.,* pp. 569–570.

[9] Later the name was changed to the New Education Fellowship, and shortly before the association was disbanded in 1955 the name reverted to its original form.

[10] Frederick Eby, *The Development of Modern Education,* 2d ed., Englewood Cliffs, N.J., Prentice-Hall, Inc., 1952, p. 630.

seems to have been verified by Dewey himself at various times, especially in a statement published shortly before his death.[11] The differences had also been noted nearly twenty years earlier by Bode and others,[12] most of whom were philosophers who pointed accusing fingers at the Progressive Education Association for what was said to be its failure to develop a satisfactory theoretical foundation. The progressive movement, they said, consisted largely of mere revolt, directed primarily against adult domination of classroom learning and the regimentation of children's activities in general. The revolt, it was said, was merely a rejection of educational practices as they were and failed to provide a well-thought-out program that could be put in their place. What was needed, said the critics, was a new educational theory and a new point of reference around which practice might be orientated in logical and orderly manner to achieve the good life as it was then conceived.

It should be noted that the philosophers were no less interested in educational reform than were the schoolmasters, but they wanted the reforms to lead to philosophically defensible and psychologically sound, constructive educational programs. To this end, Dewey, Kilpatrick, and especially Bode [13] turned to the way of life that had emerged on the American frontier for the content of the new education and to the field psychologies for its method. Our present purpose is not to analyze and discuss the theoretical differences which arose in the progressive wing of the educational profession but to call attention to the very substantial changes the divergent groups brought about in their efforts to achieve educational reform.

Reforming the Educational Program

It was seen in Chapter 15 that by the end of the nineteenth century the present system of public schools extending from the kindergarten through the university was already in existence in outline form. Thus, at the appearance of the movement to transform the schools into agencies for transmitting the ideals, attitudes, and practices unique to our way of life, there seemed little need to introduce any radically different types of institutions. Rather, the movement came to center upon changing the program of the existing schools. True, some modifications have been introduced in the organizational structure, as, for example, in the junior high school movement; but such changes have usually been made initially for reasons of efficiency

[11] John Dewey, "Introduction," in Elsie Ripley Clapp, *The Use of Resources in Education,* New York, Harper & Brothers, 1952.

[12] See especially Boyd H. Bode, *Progressive Education at the Crossroads,* New York, Newson & Company, 1938.

[13] Boyd H. Bode, *Democracy as a Way of Life,* New York, The Macmillan Company, 1937.

and economy. The opportunity these organizational innovations have presented for making changes in the program itself has generally been recognized only after the first schools of the reorganized type have been established. This is especially evident in the history of the junior high schools.

It is, of course, impossible to describe or even to list here all the changes in content and method that have been introduced in the schools in response to the reformers' demands that they must become agencies for transmitting the American way of life. Only a few of the more important ones will be mentioned briefly, and those who wish to study them in greater detail are referred to the very extensive body of literature developed on this subject during the past quarter-century.

The Atmosphere of Freedom

Of the various changes that have been made, the transformation in the general atmosphere of the school itself is a change of the greatest significance. We recall that the early public schools placed emphasis on teaching the elements of academic subject matter. When pupils began to come to school in large numbers, considerations of economy led to administrative practices that provided rigid control over every aspect of the learning process by a central office or authority. Militaristic line-and-staff types of administrative and supervisory organizations appeared, and the discipline in the classrooms suggested that it, too, had come under the influence of the Prussian drillmasters. This is the type of adult domination and regimentation to which the progressive educators later objected so vigorously.

The reconstructed school, in contrast, has been cast in the mold of the simple frontier community. That is to say, such schools attempt to give each pupil who comes to them the kind of transforming experiences those who fashioned the American way of life had in their communities. To this end, the school is organized as a community in action with its diversity of individual interests, its areas of shared needs, and its freedom to cope with them in ways determined by those who are directly involved.

The impact of the changed atmosphere is evident everywhere. Platoons of children marching to and from their classrooms, more reminiscent of the Prussian drill field than of the peaceful community, are no longer characteristic of the American educational scene. The electrifying tension formerly created by drillmaster teachers has been relaxed, and pupils and teachers now move about their respective tasks as responsible members of a free society should. Evidence of the new order can also be found in the better types of student governments encountered today and in the way the learning activities themselves are conducted in the classrooms and by the special-activities groups.

Focus on Values

In these communities in miniature, the effect of group decisions on the individual, both within and outside the group, can be observed directly by the pupils. As a consequence, the relationship between the nature and quality of political control, on the one hand, and the well-being of the individual, on the other, can be learned in its sobering, moral perspective. The same may be said for teaching the individual pupil his responsibility in a community under self-government. When the school provides a natural social setting, a commitment will be seen to have social consequences. The promise given by the individual to fulfill an assignment on which others are depending will acquire a moral dimension. Furthermore, failure to keep the promise will have its immediate and direct penalties in the school community, and therein lies the school's opportunity to teach the nature of and respect for the law of the people.

It becomes evident that such teaching-learning activity comes to grips with the very heart of the problem of values. Honesty, responsibility, integrity, respect for the individual, the spirit of cooperation, the brotherhood of man, loyalty, humility—all these and many more values—are brought to light in the social relations that prevail in the free community. The school which seizes upon them to build a better understanding of their role in creating the life good to live is fostering moral training of the highest order.

These are not values that fall in the category of incidental learning, learning that is in a sense a by-product of the main goal. They may have been so regarded by the traditional school, but in the reconstructed school they are made central and are sought directly. That is to say, what may appear to the pupil to be a casual experience encountered while in pursuit of a more tangible end is isolated in retrospect, under the direction of the teacher, so that it may be examined, extended, and intellectualized in the sense that its meaning for future use is made clear. In this manner, a school which is truly a community in miniature affords many opportunities for teaching in the concrete those values which command the loyalties of the members of the larger community of which the school itself is a part. Without this foundation of direct experiences, those loyalties and understandings would remain for the pupils, as they have so frequently remained in the past, in the realm of the abstract without touching in any vital way the lives of the pupils themselves.

In their insistence upon the necessity of teaching values through direct experience, the reconstructed schools are employing the principles of learning advocated by the field psychologists, principles that were described in the preceding chapter.

The Importance of Pupil Concerns

A third change noted in the reconstructed schools is the manner in which the educative process is initiated and the pupils are caught up in it. This change is brought to light in the current trend away from teacher-prescribed daily chores and toward problems arising out of the pupils' own experiences. It is with such problems, it will be recalled, that the process of constructing knowledge of the good, described in Chapter 19, is said to begin in the adult community. The significance of the problem approach to learning resides in the direct effort that is made to develop the ability to deal successfully with real problems, problems that grip the attention of the pupil and command his every resource in working out a solution because the solution will make a vital difference to him. In this effort, the school becomes his source of aid and hope. It affords him copartners in his search, it points him to the accumulated knowledge which is his gift from the past, and it introduces to him methods for working out his problems, especially the methods which are used and recommended to him by his elders.

It should be remembered from Chapter 19 that the American way of life is a distinctive way of dealing with the problems, both personal and social, which arise in our everyday experiences. It is the way of dealing with such problems which we as Americans have come to prefer over all the other ways of which we now have knowledge. Thus it would seem to follow naturally that in teaching our way of life to our children we must give them practice in how that process is used. The principle of teaching through practice the reconstructed schools have accepted most heartily.

Making the areas of concern to the pupil the focal points of the learning activities—that is to say, utilizing pupil-teacher planning in focusing the educational efforts—has further specific advantages. First, it makes certain that the pupils are ready from a maturational point of view for the particular learning activity in which they are to engage. Second, it guarantees that the pupils will be suitably motivated because the activity is undertaken only when it has intrinsic value for them. Third, the problem setting provides its own standards, grounded in experience, for judging the effectiveness of the solution arrived at, as well as the various measures that were employed in the process. Finally, it has psychological advantages in that attention to problem-solving procedures is continued throughout the entire school life of the child. This is in keeping with the principle of *pacing* discussed in the preceding chapter and provides for maximum growth, through well-spaced stimulation, of problem-solving ability.

Evidence of the trend toward problem-solving activities is found in the increasing amount of pupil-teacher planning, in the growing use of the ex-

perience-type study units, and in the development of core-type curricula to accommodate them. Less dramatic evidence is seen in the development of broader subject-matter categories and fused courses. The last two developments are sometimes preferred as transitional steps because they make it possible to accommodate problem-type activities of limited scope without departing too rapidly and too far from practices with which the teachers, the pupils, and the parents are already familiar.

There is also a trend to longer class periods, sometimes to such an extent that half the pupil's, as well as the teacher's, day is available to pursue the problem at hand. Flexibility is deliberately sought in setting up the new types of curricula and time schedules so that the learning activities can be made to focus on getting worthwhile things done rather than making them fit into arbitrarily set and frequently unrealistic time limits.

The Dignity of the Individual

The problem-solving approach to learning also affords illuminating experiences which portray the social advantages of individual differences. Whenever a particular problem is raised in a social setting, the differences in backgrounds, abilities, and viewpoints of the individuals consulted may be seen to result in a wider range of ideas raised for further study and sometimes may even lead to the creation of new ideas. Respect for the individual, even though he may be different, is thereby encouraged, and the unusual may come to be looked for instead of condemned. This is an important consideration, for psychological studies have shown that children come to school inclined to value conformity, a tendency indicated in the early years by their imitation of the habits and traits of their families and, later, by their conformity to the standards adopted by their peers. The urge to conform in matters of dress, speech, and behavior is said to be especially strong during the period of early adolescence. Though conformity has some social value—for obviously there can be no organized social life unless there is some measure of conformity to a common ideal or code—a democratic society would soon perish if uniformity were made to prevail.

So long as each individual acts, thinks, and believes just like every other individual, there can be no progress. Galileo was a nonconformist. His heretical theories earned him little but official censure and even persecution. But those same theories have since redirected the course of scientific and philosophical thought into more fruitful channels. Christopher Columbus was judged a fool by most of the intellectuals of his day, and he spent the later years of his life in prison. Yet he opened the way to a new world which has enriched the lives of millions. Other benefactors of mankind were not so fortunate as these two. Many of them were burned at the stake, broken on

the rack, or beheaded. The frontier community learned very slowly and at a stiff price the potential value of people, ideas, and things which are different or unusual. This lesson must not be forgotten, and the reconstructed schools propose to perpetuate it by making it a part of each pupil's direct experience while he is in school.

Further evidence of the respect the reconstructed schools have for the individual is found in their willingness to treat each pupil as a unique personality with unique potentialities. They no longer expect all pupils to learn the same things at the same time and in the same way. Nor is the pupil's progress reported in terms of arbitrarily determined standards uniformly administered. It is recognized that each pupil is different, that each matures at his own rate, that each has different interests now and will later play a different role in life. Accordingly, it should be self-evident, they say, that each pupil has different educational needs. Where grouping is employed, it now takes into account such considerations as social compatibility and pupil preferences rather than academic achievements or predicted abilities alone. Respectful attention to individual differences is a practice amply supported by the findings of the field psychologists.

The Intellectual Disciplines

The last transformation worked in the programs of the reconstructed schools to which we shall direct attention here is found in their concern for intellectualizing the problem-solving process. It is not enough, they say, for the pupils to be engaged in building a good life; the pupils must also learn to know what they are about. This lends their programs an intellectual quality that is so frequently lacking in schools that are absorbed in the task of mastering subject matter stored in books or that sponsor random activities without careful attention to well-defined purposes that are consciously held by pupils.

A few pages back we said that the reconstructed schools deliberately seek to acquaint pupils with what the adults of the supporting communities consider to be the most fruitful ways to deal with their individual as well as social problems. In American communities this has generally come to be the way developed by the frontiersmen, and, hence, it has come to be known as the American way of life. It is a way that discourages impulsive and ill-considered action just as firmly as it rejects blind subservience to tradition. It calls for a definite effort to search out better ways for dealing with present situations, to create improved arrangements, and, in brief, to construct new knowledge of what is good. These are by every justifiable standard *intellectual activities,* and, as was shown in Chapter 19, they afford their own disciplines.

Under the direction of a competent teacher, constructive problem solving is seen to be an orderly procedure. It acquires intellectual dimensions from the deliberate effort that is made to halt action to allow time to reflect on the nature of the problem at hand and on the future consequences of the first modes of behavior that spring to mind. The reflective activities themselves are given greater effectiveness when they, too, are made to follow an orderly sequence. Usually, this means that attention is given, first, to defining more carefully the problem at hand, then, to searching out ideas and scrutinizing each for its probable value, and, finally, to selecting and testing those ideas which appear to offer the best promise. It is in the second stage of the sequence that the historical, logical, and experimental techniques for producing and scrutinizing ideas, as described in Chapter 19, are employed with special profit. Reconstructed schools teach these techniques by having pupils use them within the framework of the more inclusive problem-solving process. Therefore, they are taught not as ends in themselves but as means that sometimes have value in helping us reach desired ends. Like any other means, they have value only when and to the degree that they contribute to the achievement of worthwhile ends.

It has sometimes been the tendency of some schools to treat processes as well as subject matter as ends in themselves. When schools begin to treat either a particular type of intellectual tools or a particular body of subject matter—old or new—as processes or forms sufficient in themselves to assure that good results will follow inevitably from their employment, such schools quite properly are exposed to charges of *anti-intellectualism*. In contrast, it has been the intent here to describe the historical, experimental, and logical methods of inquiry as precise intellectual tools that pupils must learn to select carefully with a view to their limitations as well as their advantages. Those tools must then be used skillfully and with conscious intent to achieve some end which lies outside the method of study and which has been determined in some measure before the selection of that method. The pupil must learn to regard processes as well as subject matter in light of their ability to help him get worthwhile things done. His education, quite properly, must bring about greater efficiency in his methods of dealing with the problems of everyday living if it is to merit the label *education* by any acceptable standard; and training pupils to use processes and subject matter wisely and effectively is by every justifiable standard an *intellectual education*.

Admittedly, the historical, experimental, and logical methods here described are intellectual tools that differ somewhat from those taught in the schools of the scholastics, the rationalists, the sense empiricists, and the social evolutionists. Furthermore, they are employed in another context, namely, the total problem-solving process. The differences, however, are now seen to arise from a difference in basic philosophy rather than from

caprice, indolence, or even ignorance, as has sometimes been wrongly charged.

Those who are kindly disposed to the new philosophy say that the reconstructed schools focus attention upon new and more fruitful kinds of intellectual disciplines than the disciplines provided by the older schools. The new disciplines are central in, and have been derived from, the community life of America itself. They are preferred because the experiences of those who have employed them have brought evidence that they lead to a better way of life. The reconstructed schools make it possible for the pupils to discover this fact for themselves. Therein, it is maintained, resides the superior value of these schools as educational institutions suited to transmit the American way of life.

STUDY AND DISCUSSION PROBLEMS RELATED TO PART IV

1. List as many forms of authoritarian political systems as you can describe. Where does the power to make decisions reside in each system? What philosophical principle is used to justify the exercise of power in each system?

2. How are the schools used by some typical present-day authoritarian governments to perpetuate power in the hands of those who now hold it?

3. What are some characteristics shared by the educational systems of present-day governments which are dedicated to democratic principles?

4. What is the meaning among democratic peoples of *freedom* and *equality* with reference to constructing and using knowledge of the good? What commitments are there among such peoples that each individual will use his own intelligence to arrive at his own decision about what is best in a matter of public concern? Why is it immoral to sell one's vote, whether for money or for other considerations?

5. John Dewey analyzed the process people have successfully used to solve problems and formulated a description of that process consisting of the familiar five steps outlined in *How We Think*. Critics have attacked the process he described on the grounds that it is anti-intellectual. Identify some of these critics and find out what processes they would substitute for Dewey's. Are these processes new, or are they similar to those reviewed in Parts II and III?

6. There is currently much interest in the education of the gifted child. Review the history of education on this subject with a view to learning how much of what is now urged upon the schools in behalf of the gifted is a return to various forms of education for a privileged few, forms which were abandoned as undemocratic by earlier generations of Americans. Are there any forms of individualized instruction in use today which do not tend to produce class distinctions and yet afford each pupil maximum opportunity to develop his special abilities to the full? If so, what are some of these practices?

7. In the period between World War I and World War II numerous books on the subject of curriculum reform were written. What were some of these books? Who were the authors? What were the reasons advanced in favor of reform? How many of those reasons are still valid today?

8. Compare the description of the pupil given by some textbook on educational methodology published about 1900 with the description given in a similar book published within the past five years. Which description gives the pupil greater dignity and respect? Which calls for the greater measure of skill and intelligence on the part of the teacher?

9. In recent years American businessmen have become concerned about teaching their employees to solve problems more effectively and to create new ideas in greater number. Inquire into these developments (see, for examples, "Buckling Down to Problem Solving," *Business Week,* January 8, 1955, page 104; and "How to Keep Ideas Coming," *Business Week,* October 22, 1955, page 112). How do these developments in business relate to the matters reviewed in Part IV?

10. Poll members of your class on the question of whether or not it is best to decide matters of public concern by popular vote based on universal suffrage. If this method is rejected, what decision-making process is offered as a substitute? Examine any such substitute proposals in light of what your social status might be if that process had been used in this country for the past century. Be sure to take note of the social class or classes to which your forebears belonged at that time as well as the opportunities that existed for them to rise above their inherited station. Has popular government made greater opportunity available to the individual of any class than have other forms of government?

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A LOOK AHEAD

It was announced at the outset that this study was undertaken so that we might learn to understand more fully the nature and significance of our own need to make decisions in education as well as in the broader arena of community life. To this end, we have endeavored to review, though of necessity in brief and fragmentary manner, the various and diverse ways in which those who have gone before us have sought to resolve the issues of their times. It now seems appropriate that we pause long enough to reflect briefly upon the matters that have been brought to light and to take stock of our present situation.

The Search for Knowledge Must Continue

While we were reviewing the efforts made by earlier generations to reach good decisions, we noted the role played by knowledge in those efforts. Successive generations came to cherish their own ways of knowing as well as their specific bodies of facts, principles, and processes. Each employed the particular set of guides in which it placed its strongest faith; yet the search for more complete and effective knowledge has been pressed century after century with undiminished intensity. The search has continued because the knowledge at hand has repeatedly been found inadequate to guarantee the desired measure of control over the future.

For a time, men believed that their inability to guarantee the future was due to the fact that they had not as yet acquired enough knowledge to give them the desired degree of control. Coupled with this assumption were the beliefs that the successive generations face essentially the same problems and that each problem has only one correct solution. Pushed to their logical conclusion, these views would lead to the expectation that all problems would ultimately be solved for all time and that the need for further decision making would no longer exist.

More recent generations, however, have come to view the matter in a different light. The problem of knowledge, they have said, is not merely one of quantity but is primarily a question of kind. The world in which we live today is not the world men knew in earlier times. The human environment, both physical and social, is undergoing constant change, and the problems of today are not those which troubled our elders, not even those of but a few years ago. Because of the relentless processes of change, each generation must take up its work at a different stage in the evolving universe, and as an inescapable consequence it has need for knowledge that is somewhat different from that which may have served other peoples in other times passably well. Furthermore, finite man is not endowed with the ability to understand fully and completely the nature of the infinite. Thus, even if an indulgent Providence were to communicate completely all divine knowledge, mere man in his limited way would be unable to comprehend it fully, and successive generations would still be called upon to find its meaning for them.

In some people, the prospect of endless change and the consequent endless search for knowledge and understanding may seem to engender a spirit of pessimism, the feeling that the effort needed to build a better world is without promise and that knowledge of the good will always lie somewhere beyond the reach of man. There is, however, another way of looking at the matter. Men have continued to search for knowledge of the good and will continue to do so because they believe they are somehow in partnership with the forces of change. The choices they make today will give important direction to the events of tomorrow. The opportunity to make choices makes the partnership effective, and it will continue to be effective only as long as men continue to exercise their opportunity to choose. It is in the freedom of choice that human dignity attains its full stature. Hence, to deprive one generation of its right to choose by imposing upon it the decisions made by another generation is to deny it the full measure of dignity to which it is entitled. Herein lies the age-old conflict between the ways of tradition and the ways of progress. And inherent in the necessity of making our own choices resides the only opportunity we have to make certain that our well-being and self-fulfillment will be matters of central concern in all decision making.

Our generation, therefore, and every succeeding generation must face up to its own problems with the confidence that it is no less able to make good decisions for its time than were our forebears competent to cope with the problems of their day. This is not to say that the road ahead will be an easy one, for the anxieties that accompany all decision making will await us at every juncture.

The Problem of Responsibility

A primary, if indeed not the foremost, problem now calling for decision is that of who shall have responsibility for decision making. Powerful individuals and special-interest groups are seeking today, as they have throughout time, to limit the voice of the people in many areas of life. The issue is raised in many ways. In politics, it has appeared in recent times in the dispute over free primaries and open nominating conventions. In education, it sometimes takes the form of formidable administrative channels which are set up to prevent direct communication between parents and teachers or between teachers and those in administrative positions. Reduced to its simplest terms, the problem of responsibility raises the question whether the individual will assume personal responsibility for decision making or will resort to the services of an authority.

The history of man's search for the right solutions to his problems presents many examples of how individuals, distrustful of their own ability to know which are good choices and which are not good, turned to some form of authority. Primitive man consulted his wizards and medicine men because he believed they were capable of communicating with the inhabitants of the spirit world. Other seekers after knowledge said to originate in another world appeared from time to time, and from such beginnings the decision-making powers claimed by the early religious and civil leaders were derived. Ecclesiastical authority as well as civil authority are sometimes justified on similar grounds today. That is to say, such authorities claim to have access to knowledge of divine origin because they are said to be the chosen instruments for receiving such knowledge. Those who follow the authorities do so because they attribute extraordinary validity to the decisions made by them.

Other men living at other times or given to different points of view accepted with equal confidence the authority of the scholar or the man of science. Here, too, the select few were said to be endowed with superior powers of knowing, and the people were persuaded to relinquish their own rights to make choices in favor of those said to be experts in these matters. Here, too, the people hoped to reap the fruits of the good life without having to endure the uncertainties of choice which accompany the responsibility of decision making.

The record is equally clear, however, in showing that the authorities of whatever type did not succeed in bringing about lasting reforms or in building a way of life that is good for everyone. Authorities, it was found, tend to perpetuate the old ways which accompanied them to power and to

be bound by knowledge which rapidly becomes outmoded with the passing of time.

Out of the disappointment experienced by those who failed to find the good life under the leadership of the authorities, a new approach to decision making was born. It originated in isolated settlements founded by exiles and nonconformists all over the world, but principally in the wilderness of North America. The new way of seeking knowledge and of making decisions abandoned the services of authorities and in their place enlisted the services of each individual in a process known as government by the people. As the frontiersmen became proficient in the ways of popular government and gained confidence in their own ability to make good decisions, they developed a way of life that not only became the source of their own joy and satisfaction but has since become the hope and aspiration of authority-dominated peoples everywhere.

The issue here is clearly between individual responsibility and freedom, on the one hand, and submission to some form of authority, on the other. We must choose either to assume responsibility for making our own decisions or to give up our freedom by allowing the decision-making powers to be taken over by someone else. There is no middle ground. Even when responsibility is delegated, as in various forms of representative government, safeguards must be employed, such as free elections, limited terms of office, and the rights of petition, referendum, and recall, to guarantee that the power to make decisions will continue to rest in the hands of the people to be exercised directly whenever they so choose.

To some who have been accustomed to identify religious faith with submission to some form of authority, this may seem to be a difficult choice. Let such individuals recall that at least some leaders in each of the three major philosophical traditions we have reviewed here were persuaded that theirs was the best method for learning to know God's will. By definition, *religion* is associated with belief in a supernatural being. Thus, an individual who asserts that God is the author of all knowledge of the good thereby takes up a positive religious position. Such an assertion does not, however, determine who may have access to knowledge of God's will or how it is to be acquired. The latter are *theological* problems, as distinguished from the strictly religious problem, and in the matter of theology many and varied positions have been assumed by deeply religious individuals.

The Problem of Participation

People who choose to submit to rule by authority are seldom troubled by the problem of participation. The number involved in the decision-making process is generally so small that everyone charged with responsibility can

readily be heard on all issues that arise. To this end, authoritarian societies quite typically employ a highly centralized form of organizational structure, and persons of responsibility are located at the center. The orders which spell out the decisions reached by the authorities flow from the center of control and tend to bring about uniformity in all the various parts.

This is not the case among those peoples who have abandoned authoritarian forms of control in favor of democratic forms. Here each individual shares

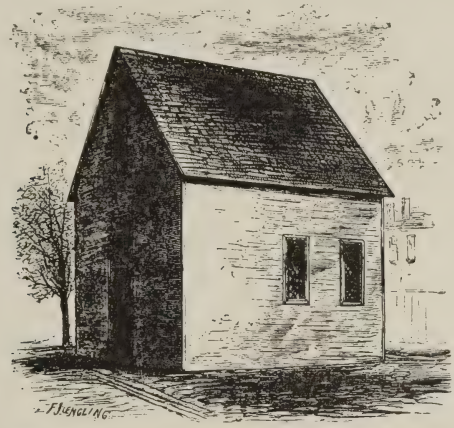

Fig. 70. The first meeting house in Salem, Mass. It was in such a building that the Pilgrims met as a congregation and as a "civil body politic."

in the responsibilities of decision making and is expected to be heard on matters of public concern. However, as the number of individuals involved becomes greater, the complexity of the problem of participation tends to increase in direct proportion.

To grasp the significance of the problem of participation in our day, we should remind ourselves that the Pilgrim's civil body politic could be assembled within the four walls of his one small meetinghouse. Here all the affairs of his community, both religious and civil, were transacted through direct participation. Some Swiss cantons as well as rural towns in New England still take care of all their civil matters in this same fashion. Many social groups and some religious bodies are also directed by the process of direct government; but obviously this method, though effective and extremely responsive to the wishes of the people themselves, has a very limited application.

Fig. 71. The people of the Canton of Glarus, Switzerland, assembled to transact their business by the process of direct government. (*Courtesy of the Swiss National Tourist Office.*)

The limitations of direct government are revealed whenever the social and governmental units grow so large in terms of the numbers of people involved that the difficulty of assembling them at one place at a given time becomes insurmountable. It was to overcome the problem of numbers that the various forms of representative government we know today were devised and adopted. Thus, as the rural towns of America grew to become small cities, they were divided into wards or districts, each small enough in population to make possible personal acquaintance with most if not all the other inhabitants of that subunit. Each subunit elected a representative to the city council, where policies were legislated by the assembled representatives in a face-to-face situation. Thus, each inhabitant of the city, though not present in the meetings of the council, still had his personal representative who spoke for him and who felt a personal responsibility to him. The mayor-and-council form of local government so well known today gives evidence of the extent to which this form of representative government has penetrated the American political scene.

Population growth did not stop with the transformation of rural towns into small cities. Instead, small cities grew to become large cities and sometimes huge metropolitan areas. In the transformation, the personal relationships which had made the old political districts friendly neighborhoods were lost. Today neighbors seldom know each other and are not likely to seek such acquaintance, for with the removal of the decision-making activities to a remote city hall, there was little left around which city neighbors might establish a common personal interest. As a direct consequence, political representation has become impersonal, and control of the power to make decisions all too often has fallen into the hands of irresponsible political machines. The attention of public officials in the larger political units is seldom focused upon the concerns and feelings of the individual citizen but of necessity has become fixed upon the impersonal problems of the mass. This situation was not sought deliberately, but it has been allowed to develop through neglect.

With the decision-making powers located so far away from the people that individuals no longer feel their concerns can receive personal attention, the tradition of government by the people is in danger of being abandoned as an unrealistic myth. The alternative to popular government is government by factions and power cliques. It is marked by conflict, factional strife, and the drive for special privileges on the part of a few at the expense of the many. In the final analysis, it spells the doom of equality, and government by the people will be brought to an end with the enthronement of some new form of authority.

The present problem calls for the invention of new forms of local governmental structures which will restore some measure of the personal pa-

ticipation which was so much in evidence in the frontier community. Otherwise, popular government, which rests so completely on public participation in decision making, may quite easily disappear from the current political and social scene.

Participation in Educational Control

The problem of participation is especially evident in the field of educational administration and control. It was noted earlier that when European powers entered the field of education the civil and religious authorities in control expected to employ the schools as agencies for imposing their decisions upon the large masses of voiceless people whom they wished to control more effectively. Accordingly, the educational programs as well as the administrative structures were imposed from above by the king, the church, or an elite class. All too frequently, the parish teacher, the headmaster, and even the chancellor were the servants of the central authority and not of the parents whose children were placed in their care. Parents and other citizens of the local community did not participate in determining either the purposes or the methods employed by those who educated their children.

We related earlier how the religious dissenters in Europe, especially that small group of English dissenters whom we know as the Pilgrims, resisted the efforts of the king and the established church to impose the official education upon them. They broke with custom by refusing to send their children to the schools provided by the authorities, and in their revolt they ended by setting up their own schools. Later, they brought to America the revolutionary notion that schools should belong to the people whose children attend them, and their schools were made subject to local, as distinguished from central, authority.

The geographical and social conditions in colonial America did much to preserve and extend the principle of local control. Although the schools continued for a time to be oriented around sectarian doctrines, the local congregations, so isolated by geographical conditions that they also soon functioned as independent governmental units, assumed responsibility for educational matters. When the first colonial laws relating to education were passed, they did not establish a colonial system of education but made it clear that the local units, by agreement of all the people in the colony, should have the responsibilities and the right to establish and maintain their own schools.

Later, when the religious fervor and the sectarian homogeneity of the local communities had diminished somewhat, the local ecclesiastical societies, charity groups, and various other local school societies claimed the right to maintain schools. Again, each society and group operated independently,

made its own arrangements for housing its school or schools, fixed the school terms, determined what would be taught, and hired and supervised the teachers. It was the supporting body, and not the central government or the hierarchy of some ecclesiastical authority, that exercised the administrative and supervisory functions; and in these independent, self-governing groups the voice of the individual member was heard quite readily.

Fig. 72. The district school attended by Horace Greeley. This school and thousands like it were established, maintained, and controlled by the people of the district through direct government.

Education in America is still a matter of local responsibility. To the extent that educational agencies have been established on the state level, they have been created by the vote of all the people to carry out specific policies and programs decided upon by all the people. Such action has been taken primarily to make possible a richer and more effective quality of education in the local communities and under the direction of the local people. That is to say, even with state aid to education the precise nature of the program in the local schools is still left to be determined by the people of the local school district.

As the populations of the various local communities grew, the complexity of their educational agencies increased in direct proportion. Not so long ago,

many of the local school districts maintained but a single school. The inhabitants of a given district transacted the necessary school business in an annual school meeting. Personal interest in the school was general, and parents participated directly in its operation and control. But as the populations increased, the local school districts were overrun by the sprawling cities and were consolidated to form a single, large municipal district. As the office of city superintendent came into being, uniform programs of education were introduced, the administration of the programs was centralized, and control of the education provided the children was moved progressively further away from the hands of their parents. In time, education came to be regarded merely as the responsibility of one of the departments of municipal government. It is a historical fact that the movement to locate control in a central educational authority was influenced in large measure by the nationalistic patterns developed in Germany, France, and England. This fact is evident in the philosophy promulgated by certain educational leaders of that day to the effect that the authority to educate resides with and is derived from the state rather than the people.

No informed individual would urge a return to the system of district schools which well served the needs of an agrarian society. However, enlightened people interested in preserving the ways of a free society are becoming increasingly concerned with the present need to establish once again a close relationship between the people and their schools. The problem is being attacked, with apparent success, from two directions.

The first line of attack is represented by current efforts to involve more people in the formulation of local educational policy. The parent-teacher organizations represent early developments toward this end. The community school-study groups and councils are of more recent origin and have made a more direct attack upon the problem of participation. Though these councils and groups cannot legislate upon educational matters, they have exerted great influence upon boards of education and elected officials in general. Their studies have led to specific program and policy recommendations. New and improved curricula and instructional practices have been introduced through their efforts. Above all, such groups, representative of all the people of the district, have awakened public interest in other matters of a community nature, including the nature of government itself. It is important to note that the administrator's role in such studies has been not one of selling his program but rather that of making it possible for the people to formulate their own programs, to participate directly in the control of their children's education.

The second line of attack is centered upon the difficulties of individual participation that arise from the great increase in the size of local school systems through population growth and consolidation. Accordingly, there

is now a noticeable trend in local school systems with many school building units to decentralize control of the educational program. The responsibility for planning and directing the activities carried on within a given building unit is increasingly being made to reside with the people connected with that building. This is in sharp contrast to the trend toward centralization of control which accompanied the rise of the city superintendencies. Decentralization, it has been found, helps remove the barriers between teachers and parents which were erected by the highly centralized administrations. Where the building principal has been made responsible for developing and operating a program designed to meet the needs of the pupils who attend his school, the desire to enlist parental participation has increased substantially. Such emancipated schools have shown a healthy inclination to involve the people of the neighborhood in study groups from which have emerged programs responsive to the neighborhood situation. Above all, people have again acquired a voice in the control of the education of their children, and the resulting effects upon neighborhood morale as well as upon the attitude toward the tradition of popular government itself have been most encouraging.

We should remind ourselves that the problem of participation arises only when people become committed to the principles of popular government. Authoritarian governments seek to discourage public participation, whereas free societies derive their strength from public participation in decision making. It seems imperative, therefore, that educators—particularly school administrators—should face squarely the problem of participation and determine at the outset and in the open whether they are committed to the propagation of a free way of life or whether their activities are to be those which foster the encroachments of ever threatening authoritarianism.

The Problem of School Size

The problem of participation has still other dimensions in the field of education. Of particular interest at this point is the implication it has for the school-pupil relationship. It must not be forgotten that free societies seek to educate their children in the ways of freedom, and accordingly, their schools are charged with responsibility for developing loyalties to the principles of freedom as well as skills necessary to its enjoyment and defense.

In this connection, we must point out that while school administrators and other public leaders have been promoting the consolidation of school districts into large administrative units there has been a corresponding trend to house more pupils and a greater number of educational activities within a single building unit. The arguments advanced in favor of the centralization movement have been the familiar ones of efficiency and economy. Admi-

tedly, numerous substantial gains have been realized from some of these developments. However, the questions must ultimately be raised: What is the point of diminishing returns, and by what standard shall the value of this development or of any educational activity be measured?

Earlier reference was made to the manner in which the frontier community fostered the development of democratic loyalties and understandings on the part of the young by involving them directly in the conduct of the common enterprise. At that time, the school was free to focus its efforts on the development of academic skills almost to the exclusion of all other considerations. It was also pointed out that this situation no longer exists as a general rule and that now the schools are called upon to foster the social education formerly so effectively provided by the community itself. Pupil involvement in the conduct of the life of the school community has therefore become an indispensable means for providing the desired social education.

The modern trend toward centralization in educational administration has produced innumerable instances in which thousands of children are housed within a single building. Quite logically, the same adverse effects produced by the great expansion of adult populations, noted above, have now become apparent among the swollen pupil populations. The elements of personal responsibility and of personal involvement have sometimes been reduced to the vanishing point, and the success of the educational effort has been measured all too frequently merely by the economic standard of how much academic subject matter can be taught to how many individuals for how little cost. The question of what happens to the pupil and to the tradition of a free society has been overlooked.

The need to provide for pupils a situation in which they may experience directly the qualitative aspects of life in a free society has come to have important social significance. The quality of the pupil's personal experience is of the greatest importance in this aspect of education, and it can acquire true value only in a situation small enough to permit the effects of individual as well as group activities upon the pupils themselves to be observed directly. All social arrangements have human consequences, and they are made to achieve specific personal ends. The ability to make and to judge social arrangements must be learned through direct involvement. The lessons of an education in the ways of a free society cannot be made effective as long as the pupil is merely a name or a number in the records of the school. The pupil must be made to feel that he is important, that he belongs in the school community and has a personal role to play in it, that he is free to participate in the direction of the community life, and that he must accept responsibility for the consequences of his decisions.

Educators who are sensitive to the need for effective social education in the modern world have become concerned with this problem of school size.

Accordingly, serious thought has been given to ways in which building populations can be kept small enough to foster the personal relationships desired without prohibitive cost. More economical materials and methods of construction have sometimes made it possible to avoid large buildings, and

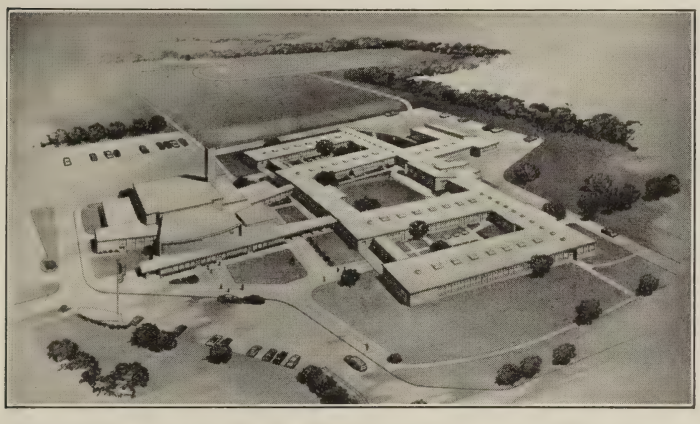

Fig. 73. Newer types of school building construction are designed to combine the friendly relations found in smaller schools with the economies realized when a large number of pupils share in the use of the more expensive facilities. Andrew Warde High School, Fairfield, Connecticut, employs a "house" plan. Each of the four units, located centrally between the auditorium and gymnasium shown on the left above and the laboratories, shops, and cafeteria units shown on the right, is occupied by a separate school or "house." That is, each has a student body of approximately 375 pupils with 19 teachers, and each consists of a representative cross-section of the total student body, including all grades, interest groups, ability levels, and social classes. Each has its own teaching staff, administrative officers, and guidance service. Each competes with the others in athletics and other activities. (*Courtesy of Lyons and Mather, Architects.*)

variations in the types of construction have been introduced which permit the breaking up of the excessively large school populations into smaller groups. Much still remains to be done, however, before all pupils can participate personally and in a significant way as full members in directing the affairs of a free and friendly school community.

The Problem of Individual Freedom

The point was made in Chapter 18 and elsewhere that in a free society the well-being of the individual is the paramount consideration. Broadly speak

ing, authoritarian societies do not quarrel with this statement but insist that the authority, and not the individual, knows what is best for him. To this end, the power to make decisions affecting the public good is made to reside with the authority. Thus, the administrative efforts of the authorities are directed to *give* the people what is good for them, and compulsion is employed wherever necessary to secure individual conformity to the ideas of the good which enjoy official sanction. As a result, the trend in authoritarian societies has been toward more and more prescription on the grounds that as more of the individual's life is determined for him he will come to live more completely the life that is good for him. This is the irresistible road to totalitarianism.

Free societies, in contrast, believe that it is necessary to modify practices and arrangements as necessitated by time, place, individual aspirations, and variations in individual personality. Those nearest the particular situation are looked upon as the ones best qualified to determine what action is most appropriate. In matters of a strictly personal nature, the individual himself must be the judge of what is good, and his freedom to determine the life good for him to live is most necessary.

Quite obviously, this is neither the time nor the place to inquire into the origin and nature of authority in democratic community life or to explore the limits of individual freedom in the face of conflict with the interests of others. Let it suffice to say that in principle the individual is free to think, to believe, and to publicize his views on any matter as long as he does not violate the standards of decency held up by the people themselves. He is also free to act as he is disposed to act, *save in those matters on which the people as a whole have prescribed a particular mode of action or have specifically forbidden certain forms of action.* Let it also be understood that in all such official matters the individual has an equal voice with every other individual in specifying both the nature and the extent of such prescription. The objective of government in a free society is to preserve the maximum degree of individual freedom consistent with the prevention of conflict in the pursuit of individual interests. In distinct contrast to the authoritarian trend toward total control, the inclination in a free society is to avoid prescription in all instances until such regulation is called for by the individuals themselves.

The problem of individual freedom is evident in the field of education in many places. Thus, when highly centralized forms of educational control were making their way into the administrative structures of the rapidly growing school districts, they quickly reflected the authoritarian influences inherent in the basic philosophical doctrines imported from abroad by leading educators of that time. Particularly evident in the centralization movement was the philosophy of the sense empiricists, who held that the best

educational practices are determined by experts in light of scientific principles discovered by experts. Identity of subject matter and uniformity of teaching methods were called for. Administrators and supervisors were said to be more expert than teachers, and conformity to a program prescribed by the central office became the expected practice.

Fortunately, the educational reformers of the past quarter-century have done much to lead the schools out of the grip of such authoritarian doctrines. Teachers now are quite frequently free to develop their individual programs within the broad framework of a general plan which they themselves have helped to formulate. Cooperative supervisory practices have come to encourage and assist teachers to be creative in their work. The encouragement of individual creativity in search of more effective ways to direct learning in a given classroom on the part of a unique group of pupils is in sharp contrast to the pressure to achieve uniformity which was exerted by supervisors a generation ago.

The problem of freedom also relates to the pupil. On the higher levels, a variety of elective subjects has come to replace the former rigidly prescribed list of subjects that made up the single-track curricula. Opportunities for self-determination are also provided on the lower levels by the new teaching methods which make possible a large measure of teacher-pupil planning and differentiation in individual learning activities. These methods are employed not merely to adapt instruction to the interests of the individual pupil but primarily to develop his sense of responsibility and his ability to make intelligent choices. The tendency to abandon the former rigid daily time schedules also gives evidence of the growing interest in helping pupils learn to use their abilities and resources intelligently and with due concern for the probable consequences to them.

Freedom of choice for the pupil has acquired special meaning in the field of guidance. Guidance services were first introduced when scientific instruments for measuring aptitude and achievement were developed by psychologists of the natural-selection school. In keeping with the authoritarian philosophy which motivated their development, these new instruments and techniques were originally looked upon as means by which the expert might discover the particular niche or role in life nature intended a given pupil to fill. Individual well-being was identified with conformity with nature's plans, and education was made to serve what was believed to be the will of nature and not that of the individual pupil. To this end, pupils were classified and assorted into homogeneous groups, each group was conditioned to play a particular role in life, and the opportunity of the individual pupil to learn was all too frequently limited by the goal set for the group and not by the aspirations of the individual himself.

The problem of individual freedom now calls for such matters to be

viewed in a different light. Individual capacities to learn and to develop new abilities are no longer looked upon as rigidly fixed traits. Capacity, field psychologists now say, can grow and be expanded within rather broad limits. Individual aspirations, therefore, need not be thwarted by the evidence provided by a test score or the level of achievement reached at a given age. Such evidence, it is now said, is indicative of past effort and opportunity rather than future possibility. Pupil objectives rather than apparent capacity should thus be taken into account in setting up the educational and vocational programs, and guidance services are now being directed toward helping pupils determine their objectives wisely. In the final analysis, a pupil's preference, based on adequate information, will outweigh the opinion of the counselor.

The practice of grouping pupils homogeneously according to ability, with corresponding limits in opportunity to learn set by the group objective, has also come under criticism. How, it is asked, can pupils develop abilities if they are not given opportunities to do so? As a consequence, grouping practices now take into account considerations of pupil purposes and objectives to a much greater degree than was the case heretofore, and the concept of the worth of the individual has been substantially enhanced in the eyes of the pupil himself.

The Problem of Method

By this stage in our study, it should be clear to everyone that the impact of the theory that knowledge of the good is constructed is merely beginning to become apparent in the field of educational theory and practice. Though instructional procedures have undergone extensive revision since 1900, most of the innovations have been inspired by the sense empiricists and psychologists of the reflex-arc schools. As a specific example, unit teaching as distinguished from daily recitation was introduced by the sense empiricists. It was intended to be used to transmit more of the subject matter prescribed by the scientific authorities with less effort and greater thoroughness. Thus, though instructional practices which incorporate unit teaching as a central aspect of their basic pattern have become widely used only within the past quarter-century, they cannot be taken as proof that the schools which employ them make their principal objective the transmission of the ways of freedom.

The same caution must be observed in reference to other twentieth-century developments. For example, the nature and significance of individual differences was not recognized until psychologists of the natural-selection schools brought them to light. Thereafter, teachers were persuaded to use individual assignments so that each pupil might be required to work to the limits of his individual capacity. But the objectives to be attained were set *for* the pupil and not *by* him. Similar comment can be made about the so-called

"activity curriculum," real-life learning situations, and various forms of homogeneous grouping practices and differentiated programs of study. All these and many more techniques and devices which are of recent origin and are hence labeled indiscriminately as "progressive" have sometimes been used to fix upon pupils attitudes, beliefs, loyalties, skills, and facts that serve authoritarian ends. The fact that they are so used by totalitarian societies even today should be evidence enough to convince each one of us that techniques and forms alone cannot guarantee democratic educational outcomes.

The problem of method therefore brings us back once again to the fundamental question of how we may learn to know what is good. The daily assignment, units of work, supervised study, planning experiences, research activities, individualized instruction, activity programs, and the myriad other practices, techniques, and devices found in the field of education today are merely tools in the arsenal of the teacher. From them, the teacher must select and use the ones which best serve the ends in view. Here again, it becomes abundantly clear that the teacher as well as the parent must be alert to the philosophical principles that should give direction to the educative enterprise if it is to be carried on intelligently.

Since the modern societies are only now becoming aware of the significance of the ways of freedom as a method for learning how to live, it is logical to assume that the full impact of this awareness has not yet made itself felt in the field of education. Much work remains to be done by way of drawing upon the educational heritage of the past and diverting to democratic ends developments that were initially designed to serve other ends. Perhaps even more important, work must be done by way of designing completely new practices and programs which have from the outset the single purpose of serving the cause of individual freedom. It is to this task that the teaching profession is now called upon to dedicate its creative talents.

We are reminded that this study began as a search for knowledge which we can believe will lead us and our children into the ways of life that are good. We feel the need for such knowledge whenever a decision must be made. The need appears to us in the form of problems that call for solution, and the good life is won to the degree that we succeed in projecting courses of action that bring about beneficial consequences. Decision making thus has future reference, and it inevitably involves an element of uncertainty.

Apparently awed by uncertainty, some people would have us refer our problems to authorities for decision. Authorities, it is said, have access to knowledge that is of a higher order, and hence is more dependable, than our own. If this is so, schools are needed to identify and prepare the authorities for their leadership responsibilities while a different type of training is needed to inculcate habits of discipline and respect on the followers. Others,

however, call upon us to make our own decisions. This, they say, is the way of free men—men of dignity with faith in the divinity of their own natures. But the education needed to teach people the ways of self-government is quite different from that which teaches them to refer their problems to authority. The two forms of education are incompatible. They cannot exist indefinitely side by side in the same school system because ultimately one will drive out the other.

All the evidence encountered in this study suggests that modern schools have taken up, in one form or another, aspects of educational content and method that were designed in the beginning to serve authoritarian ends. Sometimes these aspects have been retained even after the schools have dedicated themselves to serve the purposes of a free people. The inherent conflict is now becoming clearly evident. Policy and procedure problems are arising and teachers are being pulled this way and that. Clearly, order will not be restored until our educational efforts can again be directed toward a single objective.

This is indeed a time of decision! But it is also our fond hope that the opinions and experiences of men as we have reviewed them here may have shed some light on the path ahead.

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